

<b>Proposal #2001-</b> <u>F213</u>	(Office Use Only)
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**PSP Cover Sheet** (Attach to the front of each proposal)

Proposal Title: San Joaquin River Dissolved Oxygen Depletion Next Phase Funding Request for 2001  
 Applicant Name: Department of Water Resources, Environmental Services Office, for the SJR Dissolved Oxygen Steering Committee  
 Contact Name: Peggy W. Lehman  
 Mailing Address: 3251 S Street, Sacramento, CA 95816  
 Telephone: 916/227-7551  
 Fax: 916/227-7554  
 Email: plehman@water.ca.gov

**Amount of funding requested \$** 2,534,372

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost \_\_\_\_\_

Federal cost \_\_\_\_\_

**Cost share partners?**

**X Yes** **\_\_\_ No**

Identify partners and amount contributed by each City of Stockton - \$50,000; DeltaKeeper - \$4,200; Central Valley Regional Water Quality Control Board - \$15,000; City of Modesto - \$12,000

Include the Topic for which you are applying (check only one box).

- |  |  |
|--|--|
| <input type="checkbox"/> Natural Flow Regimes                | <input type="checkbox"/> Beyond the Riparian Corridor                |
| <input type="checkbox"/> Nonnative Invasive Species          | <input type="checkbox"/> Local Watershed Stewardship                 |
| <input type="checkbox"/> Channel Dynamics/Sediment Transport | <input type="checkbox"/> Environmental Education                     |
| <input type="checkbox"/> Flood Management                    | <input type="checkbox"/> Special Status Species Surveys and Studies  |
| <input type="checkbox"/> Shallow Water Tidal/Marsh Habitat   | <input type="checkbox"/> Fishery Monitoring, Assessment and Research |
| <input checked="" type="checkbox"/> Contaminants             | <input type="checkbox"/> Fish Screens                                |

What county or counties is the project located in? Madera; Fresno; Merced; Stanislaus; San Joaquin

**What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible** 13; 14; 12; 11; 1

Indicate the type of applicant (check only one box):

- |  |   |
|--|---|
| <input type="checkbox"/> State agency                    | <input type="checkbox"/> Federal agency   |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit   |
| <input type="checkbox"/> Local government/district       | <input type="checkbox"/> Tribes   |
| <input type="checkbox"/> University                      | <input type="checkbox"/> Private party  |
| <input checked="" type="checkbox"/> Other:               | Joint stakeholder group lead by Department of Water Resources but comprised of state and federal agencies, university, non-profit, and private parties. |

Indicate the primary species which the proposal addresses (check all that apply):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Winter-run chinook salmon  | <input type="checkbox"/> Fall-run chinook salmon   |
| <input type="checkbox"/> Late-fall run chinook salmon   | <input type="checkbox"/> Longfin smelt             |
| <input checked="" type="checkbox"/> Delta smelt   | <input type="checkbox"/> Steelhead trout           |
| <input type="checkbox"/> Splittail  | <input type="checkbox"/> Stripedbass               |
| <input type="checkbox"/> Green sturgeon   | <input type="checkbox"/> All chinook species       |
| <input type="checkbox"/> White sturgeon   | <input type="checkbox"/> All anadromous salmonids  |
| <input type="checkbox"/> Waterfowl and Shorebirds   | <input type="checkbox"/> American shad             |
| <input type="checkbox"/> Migratory birds  |  |
| <input type="checkbox"/> Other listed T/E species: _____  |  |

Indicate the type of project (check only one **box**):

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Research/Monitoring | <input type="checkbox"/> Watershed Planning |
| <input type="checkbox"/> Pilot/Demo Project             | <input type="checkbox"/> Education          |
| <input type="checkbox"/> Full-scale Implementation      |   |

Is this a next-phase of an ongoing project? Yes X No \_\_\_\_\_

Have you received funding from CALFED before? Yes X No \_\_\_\_\_

If yes, list project title and CALFED number Determination of the Causes of Dissolved Oxygen Depletion in the San Joaquin River, Project No. 99-D119

Have you received funding from CVPIA before? Yes \_\_\_\_\_ No X

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):  
\_\_\_\_\_

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Dr. Randall L. Brown

Printed name of the applicant

Stephen Ford for R. Brown  
Signature of the applicant

**DEPARTMENT OF WATER RESOURCES**

ENVIRONMENTAL SERVICES OFFICE

3251 S STREET

SACRAMENTO, CA 95816-7017



May 15, 2000

CALFED Bay-Delta Program Office  
1416 Ninth Street, Suite 1155  
Sacramento, CA 95814

SUBJECT: Next Phase Funding Request for San Joaquin River Dissolved Oxygen  
Depletion Studies

Ladies and Gentlemen:

The Department of Water Resources (DWR) on behalf of the San Joaquin River Dissolved Oxygen Steering and Technical Committees are pleased to submit a responsive next phase funding CALFED grant request for 2001 San Joaquin River (SJR) dissolved oxygen (DO) depletion studies. This request is for year 2 funding for a planned three-year program to produce a DO adaptive management action plan on the SJR. This project proposal integrates refined studies evaluating sources and mechanisms of DO depletion as well as management tool development and initial adaptive management alternatives evaluation and demonstration.

This next phase funding request does not include physical action on the ground beyond sample collection and testing of an already existing and operating jet aerator at the Port of Stockton, the pilot testing of a mobile diffused oxygen injection boat, and the planning for future demonstration of wetland/riparian treatment of oxygen depleting substances. The Port of Stockton, represented by Mr. Jay Jahangari, regularly and actively attends Steering and Technical Advisory Committee meetings, and preliminary authorization and coordination with the U.S. Army Corps of Engineers (ACOE) for jet aerator evaluation has been obtained (the ACOE operates the jet aerator). Testing of the mobile diffused oxygen injection boat does not necessarily involve a physical action on the ground or require land use approval on the part of a local government. Lastly, the wetlands and riparian demonstration project will not involve a physical action on the ground but will consist of sample collection at the Grasslands Water District in coordination with previously CALFED-funded activities with the Lawrence Berkeley Laboratory.

Furthermore, as demonstrated in the attached support letters, activities proposed in this grant are supported by a diverse group of entities including local governments represented by cities and counties. Based on these findings, it was determined that local government notification was not necessary. It must be stressed, however, that over the past year the agricultural, municipal, and environmental outreach subcommittees have

CALFED Bay-Delta Program Office

May 15.2000

Page 2

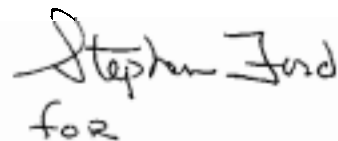
contacted and/or held workshops regarding low DO and the activities of the Steering Committee. An exhaustive effort has been initiated to reach local governments, private parties, and interested individuals, even outside the geographic scope of this proposal.

The focus of this next phase funding request, to culminate in the recommendation of an adaptive management action plan to CALFED, is the development of management tools and adaptive management alternatives evaluation. The intent of these efforts is to develop a final adaptive management action plan both scientifically defensible and approved by the diverse interests represented by Steering Committee stakeholders. A number of management alternatives exist and will be evaluated in this proposal. However, the technical and economic feasibility of alternatives are not well understood.

Because there are **\$40** million in funds allocated to solving the low DO problem in Proposition 13, it is the intent of this project to develop an adaptive management action plan that will eliminate DO depletion below water quality objectives, will be supported by a super-majority of stakeholders, and will be economically defensible. This proposal represents a broad range of individual projects and tasks, totaling nearly 20, which are technically feasible and considered necessary for development of a comprehensive understanding of oxygen depletion in the SJR and for the successful adaptive management of the DO depletion problem.

We encourage your critical review of this next phase funding request and look forward to your response as we work together to resolve this important water quality and fisheries issue.

Sincerely,

Handwritten signature of Stephen Ford in cursive script.

Randall L. Brown, Chief  
Environmental Services ~~Office~~

## **B. EXECUTIVE SUMMARY**

**Project Title:** San Joaquin River Dissolved Oxygen Depletion Next Phase Funding Request for 2001

**Amount Requested:** \$2,534,372

**Applicant Name(s):** Department of Water Resources, Environmental Services Office

**Primary Contact:** Peggy W. Lehman, Department of Water Resources (DWR), Environmental Services Office, 3251 S Street, Sacramento, CA 95816, Telephone: 9161227-7551, Fax: 9161227-7554, E-Mail: plehman@water.ca.gov

**Participants and Collaborators:** San Joaquin River Dissolved Oxygen Steering and Technical Committees; Dr. Russ Brown, Jones & Stokes; Dr. William Berelson, University of Southern California (USC); Dr. Carl Chen, Systech; Dr. Kenneth Coale, MLML; Dr. Alex Horn, University of California, Berkeley (UCB); Dr. Paul Hutton, DWR; Dr. Charlie Kratzer, U.S. Geological Survey (USGS); Dr. G. Fred Lee, G. Fred Lee Associates; Dr. Gary Litton, University of the Pacific (UOP); Dr. Gerald Miller and Pem Standish-Lee, Black & Veatch; William Powers, Powers Hydrodynamics; and Alice Tulloch, Tulloch Engineering

**Program Summary:** The DWR, on behalf of San Joaquin River Dissolved Oxygen Steering and Technical Committees are requesting second year next phase funding extension (CALFED Grant No. 99-B 16) of dissolved oxygen (DO) depletion studies and adaptive management planning. The purpose of this project is to produce an adaptive management action plan that will lead to a substantial reduction or elimination of the oxygen depletion problem in the lower San Joaquin River (SJR) during the fall. DO concentrations below 6 mg/l are thought to deter Chinook salmon passage through the Deep Water Ship Channel (DWSC) during the fall migration season. The SJR fall-run Chinook salmon is considered a "species of concern" by the U.S. Fish and Wildlife Service (FWS) and is listed as threatened by the National Marine Fisheries Service (NMFS). In addition, low DO in the DWSC can also kill, stress, or block migration of other fish and may adversely impact the resident aquatic community.

This second year proposal requests additional funds to continue study and verification of our working conceptual model for DO depletion in the lower SJR; significant local and upstream watershed inputs of oxygen demanding substances and algae, along with flow and channel geometry manipulations, contribute to oxygen depletion below water quality objectives. In addition, this proposal requests funding for continued management tool development and for the preparation of a management alternatives evaluation. Completion of these next phase funding projects will lead into a third year request for the development of a final management action plan.

Oxygen depletion in the SJR is considered a significant water quality problem in the CALFED Estuarine Restoration Program (ERP) and impedes CALFED goals to: (1) recover at-risk species, (2) rehabilitate natural processes that support natural aquatic communities, and (3) improve and maintain water and sediment quality to eliminate toxic impacts to organisms in the ecosystem. This proposal is directed toward the ERP target species fall-run Chinook salmon and Delta Smelt, and will assist with CALFED Water Quality Program goals to: (1) eliminate or reduce the frequency, magnitude or duration occurrences of DO depletion below 6 mg/l in the fall, (2) reduce the impairment or blockage of fish migration, and (3) reduce of stress to fish and other aquatic organisms due to oxygen depletion. These goals also interface with Title 34 of the Central Valley Project Improvement Act (CVPIA) and the program for restoring anadromous fish populations as outlined in "Restoring Central Valley Streams: A Plan for Action."

## C. PROJECT DESCRIPTION

### 1. Statement of the Problem

#### a. Problem

DO concentrations in the DWSC have been measured to be less than the applicable water quality objective. For example, Figure 1 indicates that hourly surface monitoring of DO concentrations at Bums Cutoff were less than 5 mg/l during periods in August and September 1999. These DO concentrations are similar to those observed during the last 15 years (19) in the DWSC and are thought to result from a combination of **high SJR** load of algae and other organic materials, as well as the biological oxygen demand (BOD) and ammonia. Low DO concentrations during the September-November period may create a migration barrier for fall-run Chinook salmon (47). Formulating an efficient and cost-effective adaptive management strategy for this water quality and **SJR** fish protection issue will require reliable models and analytical tools to identify the major causes and potential management solutions.

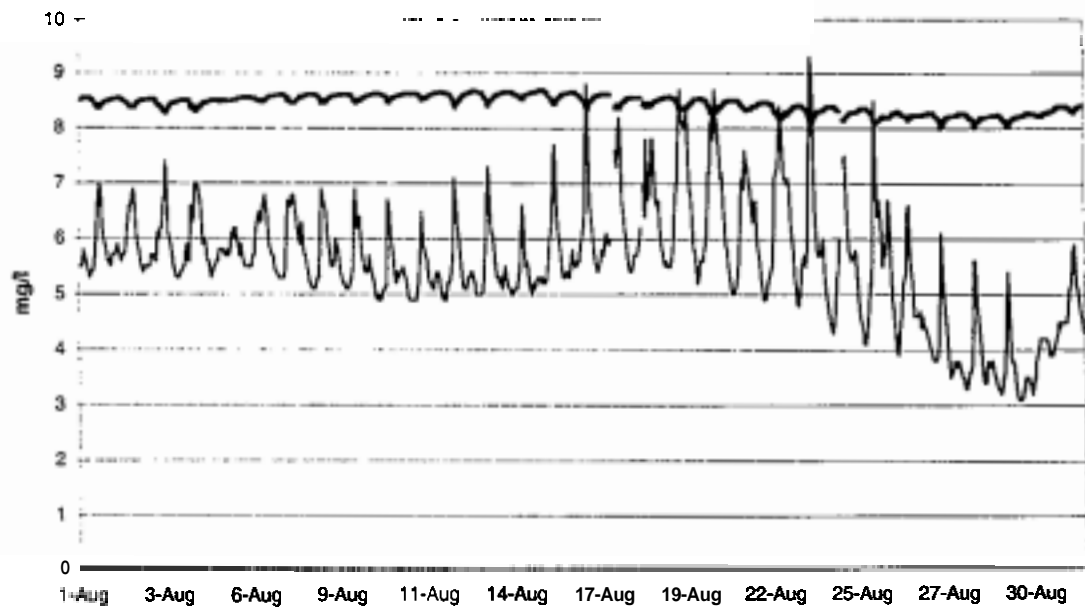
A stakeholder process was initiated in February of 1999. A technical advisory committee (TAC) has provided preliminary guidance for evaluating necessary additional scientific information, requesting CALFED grant assistance for 2000, and has directed focused monitoring and special studies during summer 1999. This next phase funding application requests additional money to continue these efforts.

#### b. Conceptual Model/c. Hypotheses Being Tested

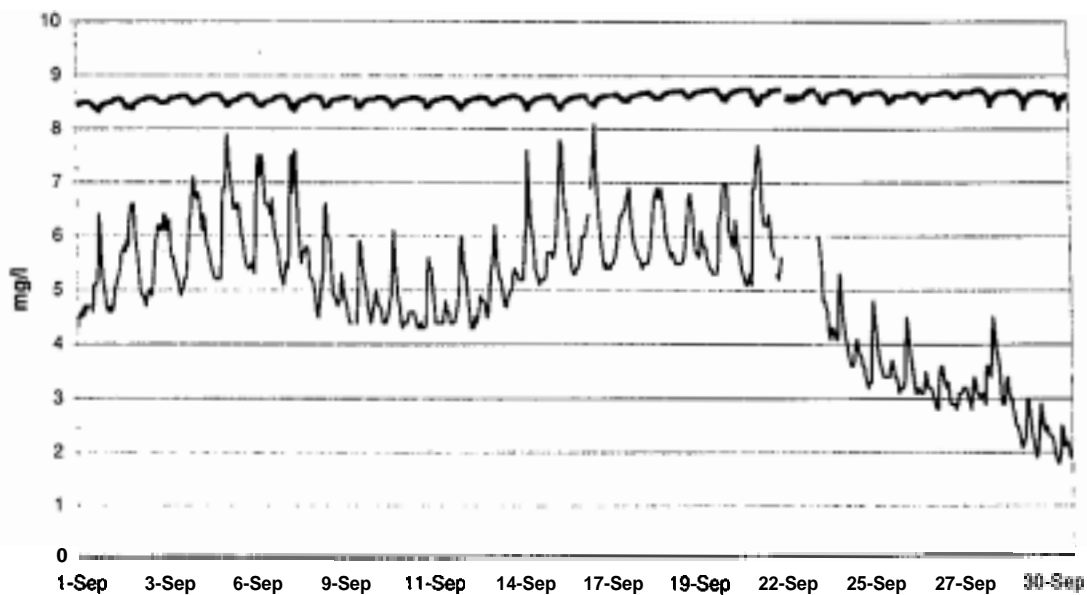
The overall conceptual model for **SJR** DO problems is shown in Figure 2. The problem area is generally identified as a 10-15 mile reach of the Stockton DWSC downstream of Stockton, where there may be local drainage and sources of algae in addition to wastewater treatment plant discharges. It is recognized that the flows and concentrations measured at Vernalis or Mossdale indicate that a major fraction of the algae and organic load entering the DWSC may originate from the tributary and drainage sources upstream of Mossdale. Mossdale is just upstream of the Head of Old River (HOR), which is a major diversion from the **SJR** and where an operable tidal gate is expected to be constructed by CALFED as part of the south Delta improvements plan. The watershed sources of nutrients, algae, and other organic materials (in other words, detritus, riparian vegetation) are transported downstream by **SJR** flow, but may also be diverted, settled, or decayed within the river corridor. Nutrients may be converted into algae and macrophyte biomass and thereby increase the river load of organic materials that may enter the DWSC and contribute to DO depletion. Therefore, the conceptual model includes the identification of sources as well as river mechanisms operating in the upstream river and DWSC. The conceptual model recognizes four major management areas: (1) control of non-point sources, (2) control of point sources including wastewater discharge, (3) flow management, and (4) aeration DWSC problem areas.

Several of the most important hypotheses from this conceptual model are being tested in the tasks and associated study proposals planned for this summer and proposed in this 2001 CALFED next phase funding grant. Figure 3 shows the DWSC conceptual model segment, with the major sources and processes that influence DO concentrations depicted. The major downstream segment hypotheses that will be evaluated in this proposal are: (D1) the conditions of warm temperatures, low **SJR** inflow (long DWSC residence times), variable tidal flows and vertical mixing, high turbidity (low light) and deep channel are major contributors to DO depletion; (D2) discharges from Stockton RWCF (BOD and ammonia) are major causes of DO depletion; (D3) river loads of algae and other organic materials (BOD) are major causes of DO depletion; (D4) deposit of algae and particulate BOD contributes to high sediment oxygen demand (SOD) in the DWSC and is a major source of DO depletion; (D5) vertical stratification during periods of surface heating and slack tides contributes to the DO depletion by isolating the surface layer and reducing potential sources of DO from the reaeration and algal photosynthesis; (D6) light limitation caused by high turbidity creates conditions of low algal photosynthesis and net algal respiration and DO depletion; and

### August 1999



### September 1999



— Measured DO    - - - Saturation DO

**Figure 1. Hourly Surface Dissolved Oxygen and Saturation Concentrations in Stockton Deep Water Ship Channel at Burns Cutoff During August and September 1999.**

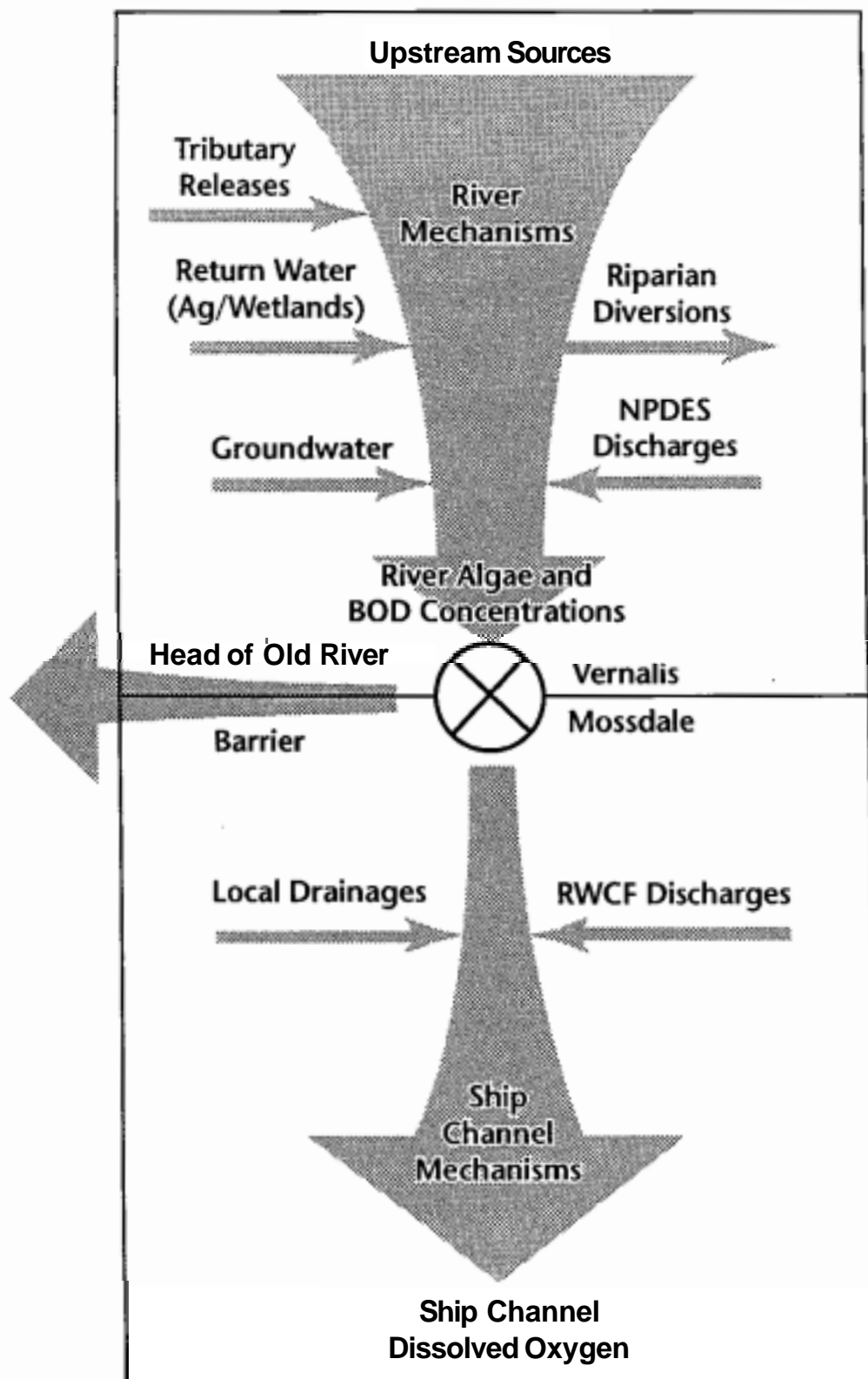


Figure 2  
Conceptual Model for Upstream San Joaquin River and  
Deep Water Ship Channel Low Dissolved Oxygen



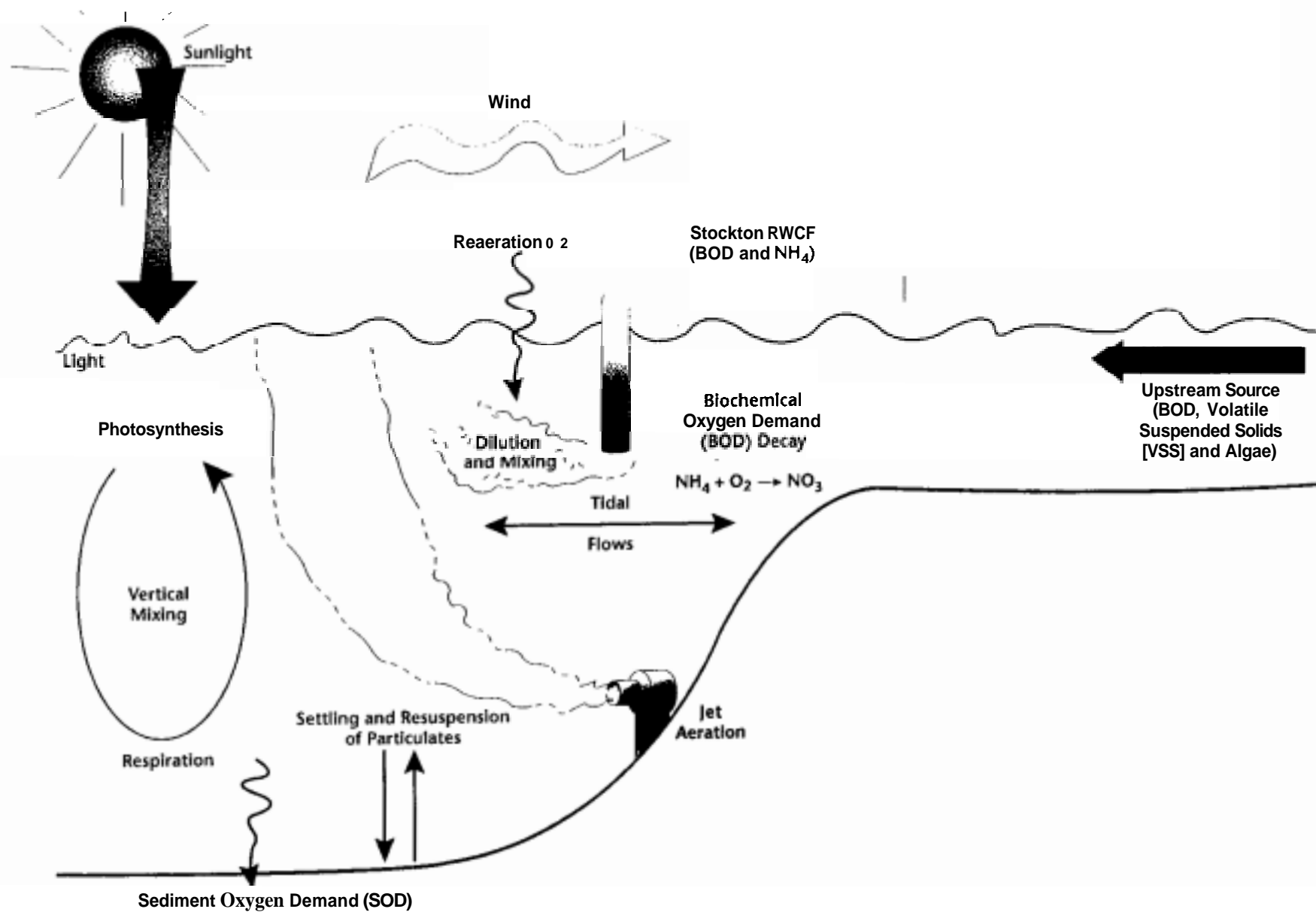


Figure 3  
Conceptual Model for Factors Affecting Dissolved Oxygen Concentration  
in the Deep Water Ship Channel

(D7) DO concentrations in the DWSC can be maintained above water quality objectives through flow management, aeration or oxygenation, and point and non-point source reductions.

Figure 4 shows the upstream SJR watershed segment of the conceptual model, with the major sources of nutrients, algae and organic detritus listed. The major river corridor processes are also listed in the upstream conceptual model diagram. The major hypotheses for the upstream segment that will be evaluated in this proposal are: (U1) river conditions of warm temperatures, low flows (long travel times), shallow water (intense light), and high nutrient concentrations are the major reasons that high algae and organic detritus (for example, VSS) concentrations are measured at Vemalis or Mossdale; (U2) the combination of flows and concentrations indicate the magnitude of upstream sources of BOD, nutrients, algal biomass, detritus (VSS) and other loads; (U3) diversions from the SJR reduce the effects of upstream loads of BOD, nutrients, algae, and VSS materials on DO depletion in the DWSC; (U4) a majority of the upstream load is diverted at the HOR and does not enter the DWSC; (U5) river settling and decay of BOD, algae, and VSS materials reduce the effects of upstream loads on DWSC DO depletion; (U6) river resuspension and growth of algae biomass increase the effects of upstream nutrient loads on DWSC DO depletion; and (U7) reduction in upstream BOD and nutrient loads would result in lower river loads of algal biomass and detritus and would reduce DO depletion in the DWSC. Each of these hypotheses will be tested with one or more of the proposed tasks.

#### d. Adaptive Management

The SJR DO stakeholder consensus process is well into the adaptive management and modeling process. The TAC has compiled the relevant historical data, used an existing water quality model to interpret the field measurements, identified the most important processes and load estimates, suggested focused tasks to fill data gaps, and extended the current understanding of the processes and factors governing DO concentrations in the DWSC. The low DO problem is generally defined, but the magnitude and severity of the current impacts from these low DO conditions is not fully known. The ecosystem goals and objectives are partially to meet water quality objectives, including improving conditions for all aquatic life in the DWSC affected by low DO, and to improve fish migration conditions during the fall. The conceptual model and major hypotheses are being refined through baseline field measurements, special studies, and quantitative model simulations. This next phase grant application includes preliminary design of restoration and corrective management actions to improve DO concentrations in the DWSC. Several tasks explore the future monitoring approach for real-time management of river flows, aeration facilities and discharge reduction actions.

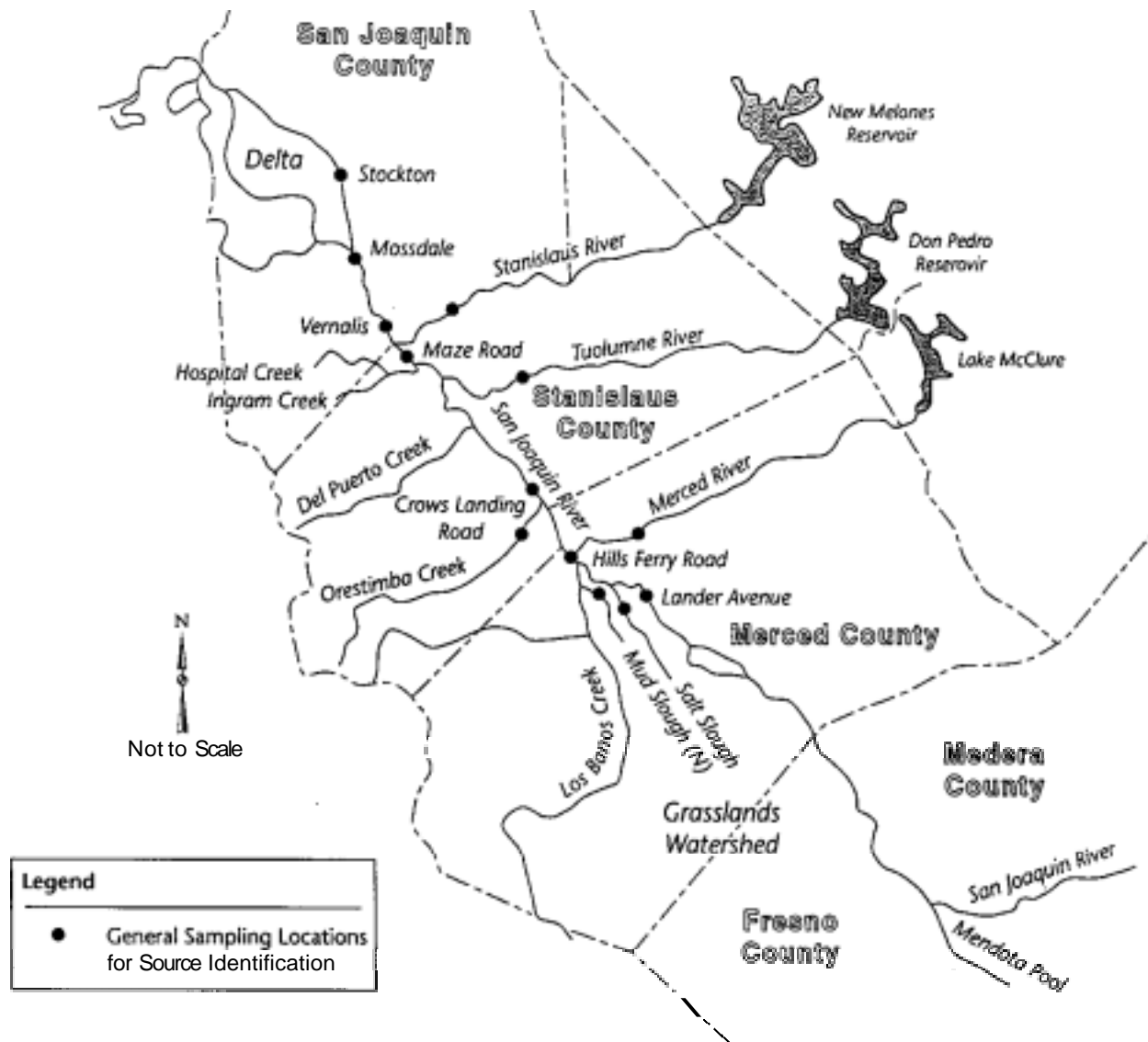
## 2. Proposed Scope of Work

### a. Project Location

The DO depletion zone is generally bound between navigation light 48 (Rough and Ready Island) and navigation lights 19 (approximately Turner Cut) along the DWSC (Figure 5). However, this next phase grant proposal seeks funding for continued research and management planning for the SJR from the DWSC to Mendota Pool (Figure 4). Spanning this linear length, there is no true project center. As shown in Figure 4, the project area includes the SJR as it flows through Madera, Fresno, Merced, Stanislaus, and San Joaquin counties. This effectively includes CALFED ecological zones 13, 14, 12, 11, and 1.

### b. Project Approach

Through an integrated study element approach, the goals of this proposal will be fulfilled through the pursuit of five general tasks. These tasks build from our current understanding of oxygen depletion in the DWSC and the sources and transport mechanisms of oxygen demanding substances in the watershed, and thus, correlate with subdivisions in the previously described conceptual model. Additional tasks of this proposal include development of analytical management tools, evaluation of management tool alternatives,



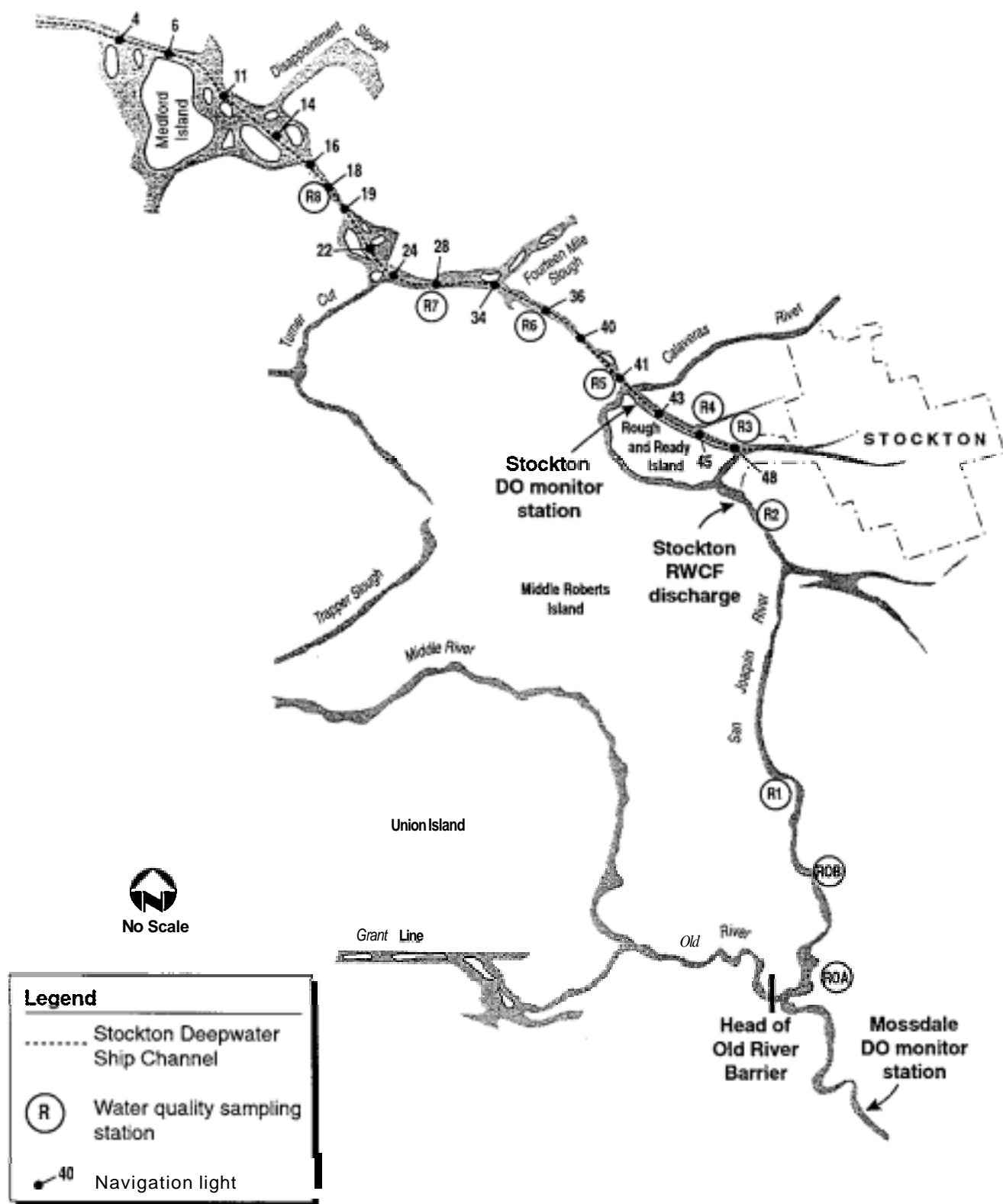
#### Upstream Sources

Agricultural Drainage  
 Grasslands/Wetlands  
 Tributary Reservoir Releases  
 Rainfall-Runoff  
 Groundwater  
 NPDES Discharges

#### River Processes

Transport (Travel Time)  
 Erosion and Deposition (SS)  
 Turbidity (Light)  
 Algal Growth (Chlorophyll)  
 Decay and Respiration (BOD)  
 Diversions and Drainage

**Figure 4**  
**Conceptual Model for Upstream Sources of Algae, Nutrients, and Organic Materials (BOD)**



**Figure 5**  
**Location of Water Quality Stations and Navigation Lights**  
**on the San Joaquin River in the Vicinity of Stockton**

and development of a DO management action plan. A detailed description of each element in this proposal is precluded in this page-limited proposal because of the large number of studies, but can be detailed further as part of the Quality Assurance Project Plan (QAPP) review process. Figure 6 graphically summarizes these funding areas, their proposed work focus, and the principal investigator involved.

#### **Task 1 - Quantification of DWSC Sources and Mechanisms.**

**Continuous Water Quality Monitoring - DWR - Dr. Peggy Lehman. References/Hypotheses: 1, 2, 3/D1, D3, D4, D5, D6.** This study element is a continuation of the monitoring network program that will be established in 2000 with existing CALFED funds. Continuous monitoring of stream flow, chlorophyll fluorescence, DO, salinity, and water temperature will be conducted at four fixed monitoring stations at key input locations. Funds will be used for equipment maintenance, data analysis, and reporting. Collected data will be used to evaluate the effectiveness of the monitoring network for "real time" management and advanced warning of low DO periods as well as provide critical inputs to management models.

**Algal Flux Study - DWR - Dr. Peggy Lehman. References/Hypotheses: 1, 2, 3/D3, D5, D6.** This study element is an extension of algal and oxygen demanding substance flux measurements that will be gathered in 2000 with existing CALFED funds. Bimonthly tidal studies at source locations will be used to quantify the net daily tidal transfer of materials that cannot be measured by the continuous monitoring system, including nutrient concentration, sediment, and organic carbon. Collected flux data in addition to light-dark algal incubation values will be used to calculate the net oxygen demand from upstream (of channel point/light 48), downstream (of Turner Cut/light 19), and local sources (DWSC turning basin). The data will be used to directly assess mechanisms responsible for the DWSC oxygen deficit and further assist in calibration and verification of the DO management model of the DWSC.

**Discrete Water Quality Sampling - City of Stockton. References/Hypotheses: 4, 19/D1, D2, D5, D6. (50-50 cost share.)** This study element is a continuation of discrete multi-parameter DWSC, turning basin, and Mossdale grab sampling conducted in 2000 with existing CALFED and City funds (50-50 cost share). Discrete sampling will be conducted on a weekly basis over 20 weeks spanning the critical fall period at 10 locations, including surface and bottom samples, and temperature/DO/pH/light vertical profiling. Parameters measured will include DO, temperature, pH, light, BOD, SBOD, total organic compounds (TOC), dissolved organic carbon (DOC), total suspended solids (TSS), VSS, NH<sub>3</sub>, TKN, NO<sub>3</sub>, NO<sub>2</sub>, phosphorus, reactive phosphorus, turbidity, electrical conductivity (EC), chloride, chlorophyll, and phaeophytin. Weekly multi-parameter sampling over a reach spanning Turner Cut to Mossdale provides valuable basic data, filling in spatial and measurement parameter gaps between continuous monitors.

**Sediment Oxygen Demand - Direct Measurement - USC - Dr. Will Berelson/MLML - Dr. Kenneth Coale. References/Hypotheses: 5, 6, 7, 8, 9, 10, 11, 12, 13/D4, D5.** This study element will directly measure SOD through the use of benthic flux chambers placed at multiple locations within the DWSC and SJR and determine whether oxygen uptake is controlled by diffusion or if pore water advection is important to oxygen transport and consumption. In addition, the chambers will be used to assess the diel variability of SOD, the local heterogeneity in SOD, and perform manipulative experiments to assess oxygen demand under variable bottom water oxygen concentrations. Collected data will be used to assess the significance of SOD in the DWSC and further assist in calibration and verification of the DO management model of the DWSC.

**Sediment Deposition and Resuspension - UOP - Dr. Gary Litton. References/Hypothesis: 14, 15, 16, 17, 18/D4, D5.** This study element will quantify the settling and resuspension rates of algae and particulates necessary to fully evaluate DO impacts and the effect settling and resuspension has on SOD. Deposit rates will be estimated with sediment traps placed at various locations and depths in the DWSC. Trapped matter will be analyzed for TSS, VSS, BOD, and chlorophyll. Composite water samples will also

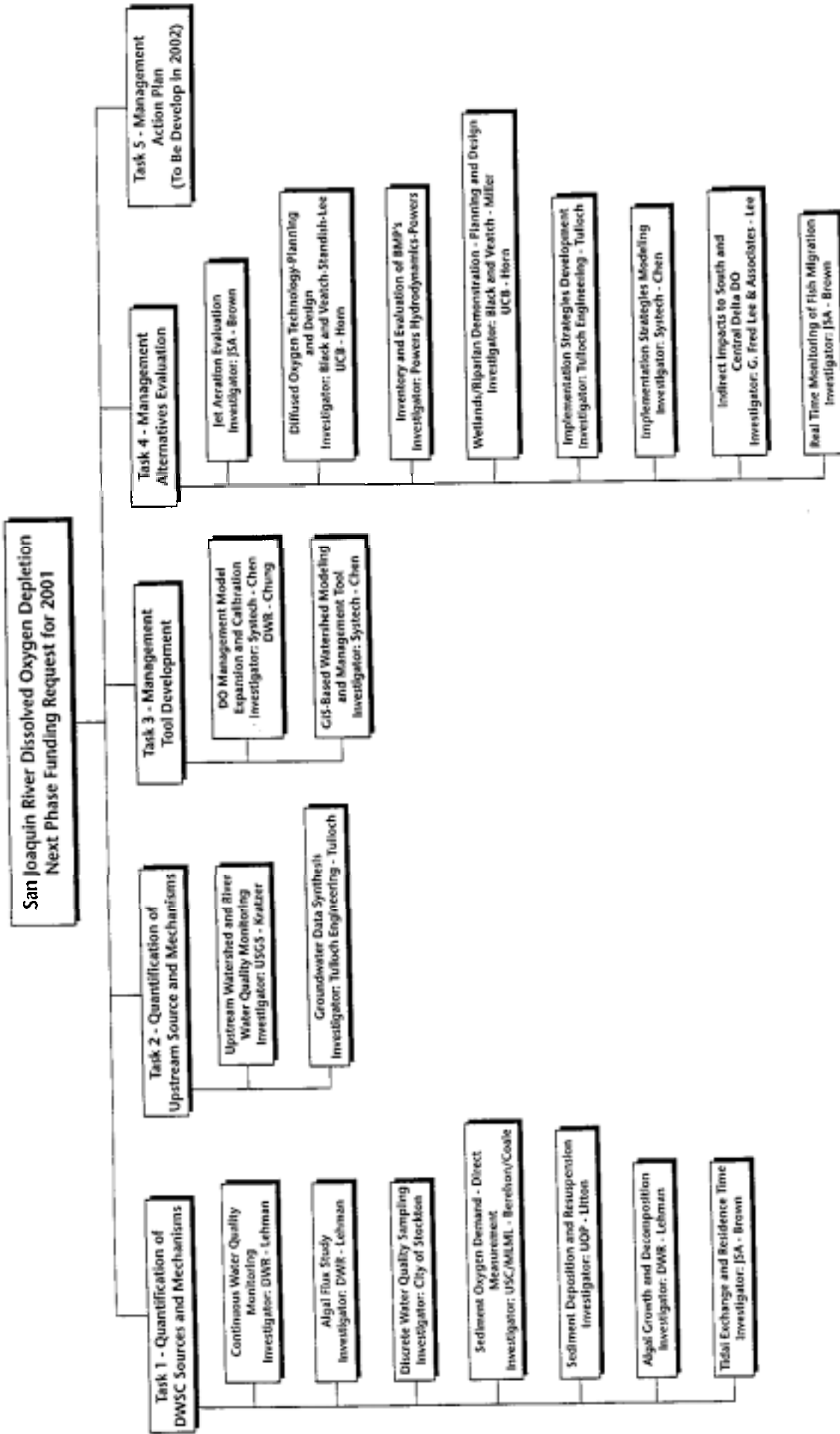


Figure 6  
Project Proposal Organization Chart

be collected at each trap depth and analyzed for TSS, VSS, BOD and chlorophyll. Long-term BOD demand trials will be performed on both water and trapped sediment. The primary settling flux and resuspension will be evaluated by two independent methods: (1) settling velocity characteristics, and (2) the use of low- and high-aspect ratio sediment traps. Vertical profiles of temperature/DO/pH/turbidity will also be conducted during periods of severe DO depletion to better characterize the spatial and temporal behavior of a critically low DO event.

**Algal Growth and Decomposition - DWR - Dr. Peggy Lehman. References/Hypothesis: 1, 2, 3/ D3, D6.** This study element will quantify oxygen demand from algal biomass (live and decomposed) produced by in situ growth and local, upstream, and downstream sources; investigate the cause of decreased algal oxygen demand between Vernalis and the DWSC; quantify the relative potential for oxygen demand from growth, respiration, and decomposition of algae from local and upstream sources under different light and temperature conditions; and quantify the relative contribution of algal versus terrestrial organic material to oxygen demand. Bimonthly field measurements of oxygen utilization in dark and light bottle incubations will be used to measure the potential growth, respiration, and decomposition of algae in the DWSC from various local and external sources and in the laboratory under various controlled temperature and light conditions. Contributions of algal versus terrestrial BOD will be determined through size fractional BOD and carbon tracer measurements. Data will be used to develop a relative contribution of oxygen demand among local, upstream, and downstream sources to the DWSC.

**Tidal Exchange and Residence Time - Jones & Stokes - Dr. Russ Brown. References/Hypotheses: 19, 20/D1, D5, D7.** This study element will investigate and quantify hydraulic residence time and net *SJR* flow, as it is influenced by tidal action in the DWSC, Delta export pumping flows through Turner Cut and the HOR as a means of accurately evaluating the significance of various flow regimes and related or expected DO depletion episodes. A rhodamine water dye or other appropriate tracer will be used to track and monitor residence time as it is related to: (1) net *SJR* flow, (2) various tidal regimes, and (3) state and federal export pumping. DWR's DSM2 hydrodynamic model and data from recently installed ultrasonic velocity meters (UVM) will be used to investigate the tidal influence of flows at the HOR. Data will be used to assist in calibration (modification of boundary conditions) of the DO management model of the DWSC and provide an understanding of how external hydrodynamic forces act upon DO depleting substances in the DWSC during critical low flow periods.

## **Task 2 - Quantification of Upstream Watershed Sources and Mechanisms**

**Upstream Watershed and River Water Quality Monitoring - USGS - Dr. Charlie Kratzer. References/Hypotheses: 21, 22/ U2, U5, U6.** This study element will be a second year continuance of the monitoring program delineating and quantify the sources of nutrients and oxygen-demanding substances in the upper *SJR* basin above Vernalis as initially established with CALFED grant 2000 funds. Monitoring and sample collection will be coordinated with FWS-funded University of California, Davis (UCD) activities, providing a collaborative sampling effort covering the mainstem *SJR*, westside, and eastside tributaries. Bimonthly sampling of the mainstem at four locations and monthly sampling of eight tributaries will be conducted for multiple parameters similar to the discrete sampling list above. In addition, isotopic measurements and tracers of possible DO-depleting substances will be conducted, building off year 2000 efforts to further distinguish sources of oxygen-depleting substances. Data will be used for calibrating the DSM2 river model (see below) and evaluating management opportunities.

**Groundwater Data Synthesis Tulloch Engineering - Alice Tulloch. References/Hypotheses: 22, 23, 24, 25/U2, U7.** This study element will collect and synthesize nutrient budget data specifically for the lower *SJR* basin, focusing on significant land applications that may affect groundwater and ultimately DO in the DWSC. These land applications, primarily wastewater treatment plants and food-processing facilities, could be significant subsurface sources of nutrients to the *SJR*. A focused records search

regarding land application of wastewater in the **SJR** will be coupled with up- and down-gradient groundwater sampling at three existing land application sites through existing monitoring wells at cooperating facilities (access to two of three sites already secured). Data will be used to assess the significance of large land application activities as well as provide data for calibration of groundwater nutrient input variables in the GIS-based watershed model (see below).

### **Task 3 - Management Tool Development**

**DO Management Model Expansion and Calibration. Systech - Dr. Carl Chen. References/Hypotheses: 26, 27, 28, 29/D1, D5, D7.** This management tool element will expand and calibrate the water quality module of DWR's DSM2 model of the SJR between Mendota Pool and Vernalis to provide a quantitative link between oxygen depleting sources and sinks that flow downstream from Vernalis. The DSM2 model will be calibrated to historic water quality measurements and those collected with CALFED 2000 grant funds. The DSM2 model will be calibrated to predict the concentrations of DO, temperature, VSS,  $\text{NH}_3$ , BOD and chlorophyll at Vernalis; the upstream boundary of the existing DO management model for the DWSC. A calibrated DSM2 model will be used for management option hypothesis testing as well as a backbone to real-time management.

**GIS-Based Watershed Modeling and Management Tool - Systech - Dr. Carl Chen. References/Hypotheses: 30, 31, 32, 33, 34, 35/U2, U7.** This management tool element will compile geographical information system (GIS) layers of digital elevation map, land uses, soil characteristics, irrigation canals, tile drains, crop types and the metadata of meteorology, irrigation water, fertilizer usage, and crop production for the entire San Joaquin Watershed. The data exists at DWR, U.S. Bureau of Reclamation (BOR), U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), Environmental Protection Agency (EPA), local farm bureaus, and irrigation districts. The compiled data will be imported into a GIS-based decision support system, WARMP, which can simulate plant-soil-water-nutrient relationships, calculate nutrients fluxes from land to groundwater and then to river, and simulate flow and pollutant loads for all tributary streams to their confluence with the SJR. Historic and recent monitoring data for groundwater and surface water (see above) will be used to calibrate the WARMP model which will then be used to evaluate effectiveness of best management practices (BMPs) (see below). The output will become input to the DMS2 model.

### **Task 4 Management Alternatives Evaluation**

**Jet Aeration Evaluation - Jones & Stokes - Dr. Russ Brown. References/Hypotheses: 19/D7.** This management alternative element will evaluate the effectiveness of mechanical jet aeration of the DWSC through a field evaluation of an existing jet aerator operated by the Army Corps of Engineers (ACOE) at Rough and Ready Island. Transfer rates will be estimated through the measurement of a tracer gas (in other words, propane) and water dye (in other words, rhodamine) from jet aeration operation during a tidal cycle (about 25 hours). Collected data will provide a measure of existing jet aerator efficiency as well as information regarding tidal influence of the jet aerator plume, jet aerator performance information with regard to operation strategy (angle, air flow, water velocity). **An** overall oxygen transfer coefficient will be calculated and an estimate of oxygen transferred per kilowatt-hour will be provided.

**Diffused Oxygen Technology - Pilot Project - Black & Veatch - Perri Standish-Lee. References/Hypotheses: 36/D7.** This management alternative element is for a pilot project to evaluate the feasibility of direct oxygen diffusion by means of mobile shipboard aeration equipment. Planning, design, and environmental assessment would include a review of existing direct oxygen diffusion in Camanche Reservoir and on the Thames River in England. **After** completion of design, the proposed pilot project would consist of furnishing a ship with a DO diffuser supplied with liquid oxygen and capable of delivering 500 lbs. of oxygen per day that would be operated for a 5-week period during the summer/fall.



delivering 500 lbs. of oxygen per day that would be operated for a 5-week period during the summer/fall. The ship would gather useful DO data in the DWSC and be able to monitor its own effectiveness at increasing DO in the channel. Feasibility would be evaluated.

**Inventory and Evaluation of BMPs - Power Hydrodynamics - Bill Powers. References/Hypotheses: 37, 38, 39, 40/U2, U7.** This management alternative element will inventory and evaluate BMPs cataloged by universities, NRCS, U.S. Department of Agriculture (USDA), California Department of Food and Agriculture (DFA), BOR, the California Farm Bureau, University of California Cooperative Extension, resource conservation districts (RCDs), Fertilizer Institute, and others with regard to nutrient and oxygen demanding substance non-point source control for agricultural and urban lands. A metadata database will be created and located with the CERES San Joaquin Valley Metadata Catalog. A summary of inventoried BMPs will be prepared with information developed for input into the GIS-based modeling effort.

**Wetlands/Riparian Demonstration - Black & Veatch - Dr. Gerald Miller/UCB - Dr. Alex Horn. References/Hypotheses: 41, 42, 43, 44, 45/U2, U5, U6.** This management alternative element is a first year planning proposal of a two-year project to inventory and evaluate existing studies on the use of riparian vegetation and wetlands on the SJR for treatment of agricultural drainage and urban storm water runoff and to demonstrate their possible effectiveness at nutrient control. To evaluate the impact of wetland management in the Grasslands Water District, sampling and analytical testing for oxygen demanding substances will be undertaken in conjunction with an ongoing CALFED project managed by LBL, Real-Time Water Quality Management. Data will be used to calibrate input variables in the GIS-based watershed model (see below). Analysis will help determine new management practices that could lessen the impact of grassland wetlands on downstream nutrient loading and subsequent low DO. **An** existing constructed wetland will be identified to demonstrate nutrient management at a later date.

**Implementation Strategies Development - Tulloch Engineering - Alice Tulloch. References/Hypotheses: D7, U7.** This management alternatives element will evaluate source control and institutional measures for DO depletion management, providing a proposed framework for a watershed stakeholder management approach. Implementation strategies will rely on past and present research undertaken on DO depletion within the watershed. With a heavy public outreach emphasis (up to 12 public meetings and workshops), this element will present various implementation strategies to those parties affected, providing explanation for how DO depletion management could work, likely through combinations of direct source control and institutional sharing of costs for real time monitoring and management of flow control and aeration facilities.

**Implementation Strategies Modeling - Systech - Dr. Carl Chen/DWR - Dr. Paul Hutton. References/Hypotheses: 27, 28, 29/D7, U7.** This management alternative element will evaluate individual and integrated management strategies for DO depletion control using the existing DO management model of the DWSC and the expanded and calibrated DSM2 river model (see above). Based on results of management strategy investigations (jet aeration, BMP evaluation), various management schemes will be tested for their effect on hypothetical or historical DO depletion episodes, including recirculation over a permanent HOR barrier. Management scheme modeling will be conducted under the direction of the TAC.

**Indirect Impacts to South and Central Delta DO. G. Fred Lee Associates - Dr. G. Fred Lee. References/Hypotheses: 2, 46/D1, D2, D3, U4. (DK labor donation.)** This management alternative element will evaluate potential indirect impacts that may result from flow management options. In particular, flow recirculation at a permanent HOR tidal barrier, could have adverse repercussions on DO in the south or central Delta. Largely through a DeltaKeeper donation of labor, monitoring will be conducted to determine the extent SJR derived oxygen demand contributes to DO depletion in areas under

**Real-Time Monitoring of Fish Migration - Jones & Stokes - Dr. Russ Brown.** References/Hypotheses: 47, 48, 49, 50, 51/D1, D7. This management alternative element will investigate the effectiveness of hydroacoustic monitoring of fish migration through the DWSC past Mossdale as a possible tool for "real-time" management during the critical depletion period. Two hydroacoustic stations, one in the *SJR* downstream of the HOR, and the second in the HOR downstream of the bifurcation with the *SJR* will be used to identify the relative upstream migration of adult Chinook salmon through the DWSC. Data from the continuous DO/temperature monitoring network and the hydroacoustic fish migration stations would provide valuable real time data for DO management.

**Task 5 - Management Action Plan Development.** Based on the prior year and 2001 investigations, modeling, and field demonstration projects, a DO depletion management action plan will be prepared utilizing an adaptive management framework based on real time monitoring, and predictive management and assessment.

**Administrative and Peer Review:** Responsibility for administration of this next phase contract will remain with DWR. Review and advice will be obtained locally through the TAC and Steering Committee. The TAC consists of nearly 20 water quality scientists. In addition, a peer review panel of outside experts will be convened to review initial work plans and final reports. Costs of administration and peer review are included in the budget table (Appendix A).

#### **c. Monitoring and Assessment Plans**

Several pilot/demonstration projects are proposed under the Management Alternatives Evaluation task. These include aeration (jet and diffused oxygen injection) and real time fish migration. The jet aerator and real time fish migration projects will act as field level management alternative demonstration projects. Both demonstration projects include an initial design phase in which the monitoring and assessment plans will be prepared due to necessary coordination with other investigators in this grant, DFG, and ACOE. The diffused oxygen injection pilot project is a two-year project, with construction and deployment in 2001. The monitoring and assessment plan will be prepared based on final engineering design considerations in 2000.

#### **d. Data Handling and Storage**

Data collected during 2001 activities will be located for public access on the IEP website following accepted quality assurance/quality control procedures. Additional funds are requested for continued management and maintenance of the database prepared by Karl Jacobs of DWR with previous year 2000 CALFED grant funding (see budget table in Appendix A for proposed funding amount). In addition, as presented above, metadata for the BMP inventory and evaluation will be located with the CERES San Joaquin Valley Metadata Catalog. All modeling tools, including the GIS-based management model, will be placed on CD-ROM for public distribution and use.

#### **e. Expected Products/Outcomes**

All investigators will develop a QAPP and contribute information for quarterly fiscal and programmatic reports and a final report that summarize and document completed work. All new data will be compiled into a quality checked database with metadata in HTML format for the IEP database. It is expected that all principal investigators will make periodic presentations of their findings to the TAC and Steering Committee for review and advice and will coordinate their work and results with other CALFED projects in order to maximize the use of resources. Products resulting from full funding of this next phase program will include: (1) a database containing information on the sources and mechanisms that cause oxygen depletion in the DWSC, (2) management tools including a model of DO in the DWSC and *SJR* between Mossdale and Mendota Pool and a GIS-based management model, (3) an evaluation of the use of a

depletion in the DWSC, (2) management tools including a model of DO in the DWSC and SJR between Mosssdale and Mendota Pool and a GIS-based management model, (3) an evaluation of the use of a continuous monitoring network for real time management, (4) quarterly and final reports, and (5) an initial evaluation and field testing of first-cut management actions.

**f. Work Schedule**

This is a request for second-year funding of a three-year project. DWR will continue to administer the contract, thus expediting and facilitating funds disbursement to subcontractors. The work schedule is: year 1 - April 1, 2000, to March 30, 2001; year 2 - April 1, 2001, to March 30, 2002; and year 3 - April 1, 2002, to March 30, 2003. Year 1 has already been funded. Year 2 will encompass an intensive study and demonstration project effort, and year 3 will primarily consist of preparation of the management action plan and real-time management system maintenance. Budget tables are attached in Appendix A.

**g. Feasibility**

The field sampling and modeling aspects of the program are fully implementable, and literature and reference citations are provided for each project described above demonstrating technical feasibility. The following projects will require coordination/collaboration with external parties: **SJR** Watershed Monitoring (coordination with UCD); Groundwater Data Synthesis (agreements secured with two of three sampling sites); DO Management Model Expansion and Calibration (commitment on the part of DWR to have an upstream DSM2 available by 2001); Jet Aeration Evaluation (agreement secured with USACE and use of existing jet aerator); Real Time Management of Fish Migration (communication established with DFG); Wetlands/Riparian Demonstration (coordination with LBL). Broad local support for project activities exists and significant impediments are not anticipated.

## **D. APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN AND CVPIA PRIORITIES**

### **1. ERP Goals and CVPIA Priorities**

The ERP Goals for the SJR include restoration of self-sustaining population of fall-run Chinook salmon and improvements in natural physical processes. In addition, the major CVPIA goals and priorities are to double the salmonid population in the Sacramento-San Joaquin River Delta. The ERP contains Stage 1 Actions for the San Joaquin River corridor, which recognizes that water quality in the river is poor due to low DO, pesticides, **high** salinity and agricultural and municipal discharges (52). Various programs are being implemented to improve river water quality including reductions in salts and pesticides from agricultural drains and treatment upgrades and improvements at the major municipal wastewater treatment plants along the river. In addition, CALFED's Multispecies Conservation Strategy (MSCS) stresses the need for improving water quality conditions is key to river ecosystem restoration activities (53).

### **2. Relationship to Other Ecosystem Restoration Projects**

There are many critical restoration projects on tributaries upstream of the DO depression. Restoration projects are occurring on the Stanislaus, Calaveras, Merced and Tuolumne Rivers that are essential in improving salmonid populations. The DO project is important because if low DO levels are impeding salmon migration, the full potential of these and future restoration projects and the investment CALFED has made in these projects will not be fully realized.

Several projects proposed under this second-year proposal will collaborate or integrate with funded CALFED projects, including a tagging study to determine the movement of fish past the low DO concentration in the DWSC by Dan Odenweller (DFG), DOC studies in the San Joaquin River by Dr. Brian Bergemashi (USGS), sediment metal **flux** studies to be conducted by Dr. Coale and Dr. Stephenson (Assessment of Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed), water quality studies conducted by LBL (Real-Time Water Quality Management in the Grassland Water District), and Central Valley tributary nutrient monitoring/modeling by Dr. Dahlgren of UCD (Water Quality-Food Resource Model for Central Valley Rivers). In the later case, collected data will be coordinated and shared so as to eliminate duplicity and redundancy.

### **3. Requests for Next-Phase Funding/4. Previously Funded CALFED or CVPIA Projects**

Please see the attached update in Appendix B.

### **5. Systemwide Ecosystem Benefits.**

Reduction of the oxygen depletion in the DWSC will restore ecosystem process and function by removing a presumed block to upstream migration for adult fall-run Chinook salmon and provide access for these fish to newly developed CALFED upstream salmon habitat. It will also remove a potential threat to the health and survival of other aquatic organisms such as the Delta Smelt and various resident species.

## E. APPLICANT QUALIFICATIONS

The following is a brief summary of biographical sketches for lead investigators and principal participants. Association with individual project tasks was provided in the scope of work *summary* above. Each lead investigator will be responsible for obtaining resources and organizing staff for their element of the project, but all collaborators will share boats, equipment, and information as needed. Interpretation of collected data will include full collaboration through the TAC. Administration of contracts, keeping the project on schedule, and providing products and deliverables (quarterly and year-end report) will be the responsibility of the principal investigator, Dr. Peggy Lehman of DWR.

Dr. William Berelson is an Associate Research Professor at USC, where he received his Ph.D. in 1985. Dr. Berelson's research interests include global budgets of carbon, silica, nitrogen and phosphorus; factors that control the cycling of metals and nutrients in coastal and marine sediments; calcium carbonate dissolution kinetics and its impact on paleoceanographic reconstruction; development of in situ device technology; and the use of radioisotopes and other tracers for mixing and advection in marine waters and sediments.

Dr. **Russ** Brown is a consultant with Jones & Stokes and has worked on Delta water supply and water quality projects for over ten years. Dr. Brown authored the report "Potential Solutions for Achieving the San Joaquin River Dissolved Oxygen Objectives" for the 1998 California State Water Resources Control Board (SWRCB) Delta hearings. His expertise is in water quality measurements and hydrologic/water quality modeling.

Dr. Carl Chen is a consultant with Systech Engineering and maintains M.S. and Ph.D. degrees in environmental engineering from UCB. Dr. Chen participated in the development of a hydrodynamic water quality model of San Francisco Bay, the EPA Stormwater Management Model, and the eutrophication model of Lake Washington. He developed the existing DO management model for the DWSC, the graphical user interface for the real time water quality management of the SJR, and the model for transport and the fate of suspended sediment and copper in San Francisco Bay.

Dr. Kenneth Coale is the acting director of Moss Landing Marine Laboratories and a biogeochemist with expertise in metal, nutrient and radionuclide cycling in marine and lacustrine systems. Research interests include the study of fluxes of nutrients, metals, and oxygen across the sediment/water interface of the Los Angeles/Long Beach and San Francisco Bay systems (ONR-funded); the study of mercury cycling and bioavailability in the San Francisco Delta system (CALFED-funded); and the role of trace metals in controlling phytoplankton production and carbon cycling in the global ocean (NSF/U.S. Department of Energy (DOE)-funded).

Dr. Alex Horn is a professor of ecological engineering at UCB. Dr. Horn's expertise in the evaluation of water quality has lead him through projects involving eutrophication and algal nuisance control in freshwater, lakes, rivers, and estuaries in California. He has been involved in the design of the Prado Wetlands on the Santa Ana River and the San Joaquin Marsh in Irvine, California. He will serve as a consultant throughout the pilot project.

Dr. Paul **Hutton** is currently chief of DWR's Delta Modeling Section in the Office of State Water Project Planning. Dr. Hutton has over 15 years experience in the areas of water resources and environmental engineering planning, design, construction and operations

Dr. Charlie Kratzer has been working on water quality issues in the San Joaquin River since 1983, first at SWRCB (1983-91), and then at USGS (1991 to present). At SWRCB, Dr. Kratzer was responsible for the development of the San Joaquin River Input-Output (SJRIO) model. At USGS, he was the surface-water specialist on the San Joaquin NAWQA. He has published several reports and journal articles on water quality in the SJR.

**Dr. G. Fred Lee** is a consultant with G. Fred Lee Associates. Dr. Lee has academic degrees in environmental sciences and environmental engineering/water quality, including a Ph.D. from Harvard University in 1960. For 30 years he held university graduate level teaching and research positions at several major U.S. universities. In 1989 he became a full-time consultant, working on water quality management issues, including various issues related to water quality of the Delta. He has extensive experience in evaluating the cause of DO depletion in waterbodies related to planktonic algae death/decay and wastewater oxygen demand.

**Dr. Peggy Lehman** received her Ph.D. in ecology from UCD and has been a senior scientist with DWR for the past 15 years. Dr. Lehman's expertise is in phytoplankton ecology and water quality. She has published government reports and peer review journal articles on data analyses and field studies pertaining to phytoplankton and water quality in the Sacramento-San Joaquin Delta.

**Dr. Gary Litton** is an associate professor in the Department of Civil Engineering at UOP. Dr. Litton has 20 years of water quality experience, 13 of those with the RWQCB. As a researcher and professional engineer, he has conducted water quality monitoring and modeling investigations, water quality planning, pollution impact studies, acid-mine drainage abatement, and subsurface remediation. He is currently the principal investigator of water quality studies in the SJR that focus on urban storm water and agricultural runoff as well as prepared DO studies for the City of Lodi.

**Dr. Gerard Miller** is a consultant with Black & Veatch. Dr. Miller has served as manager of a wide variety of water, wastewater, and environmental projects over the last 25 years. Projects related to wetlands work include the use of hyacinths as first stage treatment at a wastewater plant in San Diego, California. Other projects employed cattails for supplemental nitrogen removal in a wastewater reclamation process, and the use of macrophytes and hardwoods to treat storm water discharges.

**Bill Powers** is a consultant with Powers Hydrodynamics. Mr. Powers has conducted studies on sediment and tail-water reduction for the BOR on a grant through the West Stanislaus RCD. He is currently working on the second year of a third study for the BOR to outline BMPs for the reduction of tail-water and sediment in furrow irrigation.

**Perri Standish-Lee** is a consultant with Black & Veatch. Ms. Standish-Lee has 24 years of experience in the evaluation of source water quality including surface and ground water supplies. She has served as a liaison between clients and federal, state, and local regulatory agencies as manager of a wide variety of water, wastewater, and environmental projects.

**Alice Tulloch** is a consulting professional engineer with Tulloch Engineering and has over 22 years of experience in environmental engineering and community-based decision making. Ms. Tulloch's areas of professional practice have included environmental and sanitary engineering, public utilities, infrastructure planning, budgeting, rate making, utility field operations, structural engineering, and construction administration.

**Conflict of Interest:** A possible conflict of interest exists in the participation of Systech Engineering and Jones & Stokes as consultants to the City of Stockton. Furthermore, possible conflict of interest exists in the participation of Tulloch Engineering, Powers Hydrodynamics, and G. Fred Lee Associates as previous consultants to municipal, agricultural, and environmental interests, respectively. Lastly, the participation of DWR and the City of Stockton maintains a possible conflict of interest. These conflicts arise through the encouraged participation of stakeholders in the San Joaquin River Dissolved Oxygen Steering and Technical Committees. This inherent opportunity for bias is an artifact of the stakeholder process. However, through diligent exercise of a clear consensus doctrine, coupled with internal TAC peer review and outside peer review (funding requested herein), possible bias in data analysis and interpretation will be minimized.

## **F. COST**

### **1. Budget**

A summary budget table has been attached (Appendix A). Individual project expenses, including salary and benefits, travel, materials, overhead, and equipment, have been itemized where appropriate given the individual project tasks. In general, service contracts include subcontractor or vendor fees, including laboratory and some specialized sampling costs. Overhead costs cover administrative costs, office space, and the like. Benefits are generally 10-12 percent of salary. Budget specifics are added as footnotes to the summary budget table. Travel fees are associated with site/field visits, stakeholder meetings, and workshops. Fees are based on estimated travel expense to and from office locales and job sites primarily on a mileage rate ranging from \$0.30 to \$0.35 per mile and higher for specialized vehicles and or equipment. Project management fees are associated with progress report preparation and meetings, and general project oversight through the entire project period.

### **2. Cost Sharing**

Several entities have pledged funds for 2001 activities. Several of these entities also pledged funds for 2000 and are acting and continuing contributors. These entities include the Central Valley Regional Water Quality Control Board (RWQCB) for a labor and laboratory contribution of \$5,000 and \$10,000 respectively; the City of Stockton for a direct money contribution of approximately \$50,000; the City of Modesto for a direct money contribution of approximately \$12,000 and an indeterminate labor contribution; and DeltaKeeper for a labor donation equivalent to approximately \$4,200.

Boats and equipment owned by DWR, City of Stockton, and DFG will be used for study activities whenever possible and will be a significant cost share.

Funding priority generally follows the major tasks. Full funding of Task 1 (Quantification of DWSC Sources and Mechanisms) would cost \$717,016. Full funding of Task 2 (Quantification of Upstream Watershed Sources and Mechanisms) would cost \$307,395. Full funding of Task 3 (Management Tool Development) would cost \$382,003. Full funding of Task 4 (Management Alternatives Evaluation) would cost \$966,279. The Technical Committee has approved all of the proposed study elements and full funding of all tasks will accelerate progress and provide important information for the TMDL stakeholder consensus process and for the most cost-effective use of Proposition 13 funding to resolve the low DO concentrations in the **SJR** DWSC.

## G. LOCAL INVOLVEMENT

This proposal was developed with the input of the *SJR* DO Steering and Technical Committees which represent urban, agricultural, environmental, and government stakeholders, including (1) the Cities of Stockton, Manteca, Lathrop, Lodi, Merced, Turlock, Tracy, and Modesto; (2) the California Farm Bureau; (3) DeltaKeeper; and (4) DWR, Central Valley RWQCB, FWS, USGS, and BOR.

The City of Stockton has funded professional Steering and Technical Committee facilitation by Kevin Wolf and Associates and has also funded public outreach and relations with Judith Buethe Public Relations. To date, local involvement has included regular monthly meetings of the *SJR* DO Steering Committee in Stockton as well as frequent public outreach workshops held by the Municipal, Agricultural, and Environmental Outreach Committees. Similar activities are proposed for 2001.

Please see letters of support for this proposal attached in Appendix C. Regular activities of the *SJR* DO Steering Committee and subordinate committees are publicly posted and regularly updated at <http://www.sjrmdl.org>.

**Third Party Impacts:** Third party benefits include: (1) assumed improvement of water quality in the south Delta for agricultural and Delta exporters (please see South and Central Delta Water Quality Monitoring for verification of this assumption), and (2) accessibility of upstream habitat and reduction of mortality and stress of salmon and other aquatic organisms of the *SJR*.



## **H. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS**

All applicable state (Interagency Agreements) and federal (Standard 424, 424A, 424B, and DI-2010) forms are provided **under** Threshold Requirements.

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49. United States Fish and Wildlife Service, 1997. Enumeration of Chandalar River Fall Chum Salmon Using Split-Beam Sonar. Alaska Fisheries Technical Report Number 42. July 1997.
50. Finish Game and Fisheries Research Institute, 1997. Hydroacoustic Estimation of Salmon Spawning Run in the River Tomio. Project Results 1995-1996. April 1997.

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## **J. THRESHOLD REQUIREMENTS**

This section of the applicant's proposal contains the following items.

Letters of Notification (see Cover Letter re Exemption therefrom)

Environmental Compliance Checklist

Land Use Checklist

State Forms

4187 - Interagency Agreements

Federal Forms

SF 424

SF 424A

SF 424B

DI-2010

# Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?

X  
YES

        
NO

Diffused Oxygen Technology Pilot Project; Jet Aeration Evaluation; Diffused Oxygen Technology Pilot Project

2. If you answered yes to # 1, identify the lead governmental agency for CEQA/NEPA compliance.

Department of Water Resources/U.S. Bureau of Reclamation  
Lead Agency

3. If you answered **no** to # 1, explain why CEQA/ NEPA compliance is not required for the actions in the proposal .

4. If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.

Compliance will be initiated upon completion of conceptual design. A negative declaration/FONSI exemption/exclusion is anticipated.

5. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

X  
YES

        
NO

If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with **30** days of notification of approval.

Property access is required for research and monitoring. With exceptions as described in the feasibility section of the proposal text, field locations will be identified at a later date. Under all possible circumstances, private property access will be avoided through use of public lands or existing public or stakeholder collaborating facilities.

6. Please indicate what permits **or** other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

**LOCAL**

Conditional use permit	<input type="checkbox"/>
Variance	<input type="checkbox"/>
Subdivision Map Act approval	<input type="checkbox"/>
Grading permit	<input type="checkbox"/>
General plan amendment	<input type="checkbox"/>
Specific plan approval	<input type="checkbox"/>
Rezone	<input type="checkbox"/>
Williamson Act Contract cancellation	<input type="checkbox"/>
Other _____	
(please specify)	
None required	<input type="checkbox"/>

**STATE**

CESA Compliance	<input type="checkbox"/>	(CDFG)	
Streambed alteration permit	<input checked="" type="checkbox"/>	(CDFG)	- wetlands/riparian demonstration
CWA § 401 certification	<input checked="" type="checkbox"/>	(RWQCB)	- wetlands/riparian demonstration
Coastal development permit	<input type="checkbox"/>	(Coastal Commission/BCDC)	
Reclamation Board approval	<input type="checkbox"/>		
Notification	<input type="checkbox"/>	(DPC, BCDC)	
Other _____			
(please specify)			
None required	<input type="checkbox"/>		

**FEDERAL**

ESA Consultation	<input checked="" type="checkbox"/>	(USFWS)	- hydroacoustic fish netting verification; diffused oxygen technology
Rivers & Harbors Act permit	<input type="checkbox"/>	(ACOE)	
CWA § 404 permit	<input checked="" type="checkbox"/>	(ACOE)	- wetlandsinparian demonstration
Other _____			
(please specify)			
None required	<input type="checkbox"/>		

DPC = Delta Protection Commission  
CWA = Clean Water Act  
CESA = California Endangered Species Act  
USFWS = U.S. Fish and Wildlife Service  
ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act  
CDFG = California Department of Fish and Game  
RWQCB = Regional Water Quality Control Board  
BCDC= Bay Conservation and Development Comm.



# Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. Do the actions in the proposal involve physical changes to the land (i. e. grading, planting vegetation, or breaching levees) or restrictions in land use (i. e. conservation easement or placement of land in a wildlife refuge)?

        
YES

  X    
NO

2. If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).

Proposal actions are generally research and planning. Wetlands/riparian demonstration will use an existing suitable constructed wetland to be identified as part of proposal planning and design activities.

3. If YES to # 1, what is the proposed land use change or restriction under the proposal?

4. If YES to # 1, is the land currently under a Williamson Act contract?

        
YES

        
NO

5. If YES to # 1, answer the following:

Current land use

Current zoning

Current general plan designation

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?

        
YES

        
NO

        
DON'T KNOW

7. If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?

\_\_\_\_\_

8. If YES to # 1, is the property currently being commercial I y f armed or grazed?

        
YES

        
NO

9. If YES to #8, what are

the number of employees/acre \_\_\_\_\_

the total number of employees \_\_\_\_\_



Agreement No.: CALFED Grant 99-B16

USBR #00FC200020

Exhibit: \_\_\_\_\_

**STANDARD CLAUSES -  
INTERAGENCY AGREEMENTS**

**Audit Clause.** For Agreements in excess of \$10,000, the parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the Agreement. (Government Code Section 8546.7).

**Availability of Funds.** Work to be performed under this Agreement is subject to availability of funds through the State's normal budget process.

**Interagency Payment Clause.** For services provided under this Agreement, charges will be computed in accordance with State Administrative Manual Sections 8752 and 8752.1.

**Termination Clause.** Either State agency may terminate this Agreement upon thirty (30) days' advance written notice. The State agency providing the services shall be reimbursed for all reasonable expenses incurred up to the date of termination.

**Severability.** If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

**Y2K Language.** The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant" For purposes of this Agreement, a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

# APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 03484043

<b>1. TYPE OF SUBMISSION:</b> Application <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction		<b>2. DATE SUBMITTED</b> May 15, 2000	Applicant Identifier
Preapplication <input type="checkbox"/> construction <input type="checkbox"/> Non-Construction		<b>3. DATE RECEIVED BY STATE</b> CALFED Grant 99-731	<b>4. DATE RECEIVED BY FEDERAL AGENCY</b> Federal Identifier USBR 00FC200020

<b>5. APPLICANT INFORMATION</b> Legal Name: Department of Water Resources, Environmental Services Office. Address (give city, county, State, and zip code): 3251 S Street Sacramento, CA 95816		Organizational Unit:  Name and telephone number of person to be contacted on matters involving this application (give area code): Peggy Lehman. 9161227-7551
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<b>6. EMPLOYER IDENTIFICATION NUMBER (EIN):</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">             94-6355570           </div>	<b>7. TYPE OF APPLICANT:</b> (enter appropriate letter in box) <input type="checkbox"/> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;">             A. Slate              B. County              C. Municipal              D. Township              E. Interstate              F. Intermunicipal              G. Special District           </div> <div style="width: 48%;">             H. Independent School Dist.              I. State Controlled Institution of Higher Learning              J. Private University              K. Indian Tribe              L. Individual              M. Profit Organization              N. Other (Specify) _____           </div> </div>
--	---

<b>8. TYPE OF APPLICATION:</b> <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> New           <input checked="" type="checkbox"/> Continuation           <input type="checkbox"/> Revision         </div> If Revision, enter appropriate letter(s) in box(es) <div style="display: inline-block; border: 1px solid black; padding: 2px; margin: 0 5px;">A</div> <div style="display: inline-block; border: 1px solid black; padding: 2px; margin: 0 5px;">C</div> A. Increase Award    B. Decrease Award    C. Increase Duration D. Decrease Duration    Other (specify): _____	<b>9. NAME OF FEDERAL AGENCY</b> U.S. Bureau of Reclamation
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<b>10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER.</b> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 10px;">             99-816           </div> TITLE: _____	<b>11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT</b> San Joaquin River Dissolved Oxygen Depletion Next Phase Funding Request for 2001
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<b>12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):</b> Co.'s of Madera, Fresno, Merced, Stanislaus, and San Joaquin.		<b>13. PROPOSED PROJECT</b> Start Date: 4/1/2001    Ending Date: 3/30/2002
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<b>14. CONGRESSIONAL DISTRICTS OF</b> 11th, 18th, 19th, and 20th.	<b>15. ESTIMATED FUNDING:</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">a. Federal</td> <td style="width:20%;">\$ 2,534,372</td> <td style="width:10%;">m</td> </tr> <tr> <td>b. Applicant</td> <td>\$</td> <td>00</td> </tr> <tr> <td>c. Slate</td> <td>\$ 15,000</td> <td>00</td> </tr> <tr> <td>d. Local</td> <td>\$ 66,200</td> <td>00</td> </tr> <tr> <td>e. Other</td> <td>\$</td> <td>00</td> </tr> <tr> <td>f. Program Income</td> <td>\$</td> <td>00</td> </tr> <tr> <td>g. TOTAL</td> <td>\$ 2,615,572</td> <td>00</td> </tr> </table>	a. Federal	\$ 2,534,372	m	b. Applicant	\$	00	c. Slate	\$ 15,000	00	d. Local	\$ 66,200	00	e. Other	\$	00	f. Program Income	\$	00	g. TOTAL	\$ 2,615,572	00
a. Federal	\$ 2,534,372	m																				
b. Applicant	\$	00																				
c. Slate	\$ 15,000	00																				
d. Local	\$ 66,200	00																				
e. Other	\$	00																				
f. Program Income	\$	00																				
g. TOTAL	\$ 2,615,572	00																				

<b>16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?</b> a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE _____ b. No. <input checked="" type="checkbox"/> PROGRAM IS NOT COVERED BY E. O. 12372 <input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW	<b>17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?</b> <input type="checkbox"/> Yes    If "Yes," attach an explanation. <input checked="" type="checkbox"/> No
--	--

<b>18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.</b>		
<b>a. Type Name of Authorized Representative</b> Dr. Randall L. Brown	<b>b. Title</b> Chief of Environmental Services Office	<b>c. Telephone Number</b> 916/227-7593
<b>d. Signature of Authorized Representative</b> 		<b>e. Date Signed</b> May 15, 2000

# BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. CALFED 2001 for	SJR DO Depletion	\$	\$	\$ 2,534,372	\$ 81,200	\$ 2,615,572
2.						
3.						
4.						
5. Totals		\$	\$	\$ 2,534,372	\$ 81,200	\$ 2,615,572
SECTION B - BUDGET CATEGORIES						
6. Object Class Categories		GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
		(1)	(2)	(3)	(4)	(5)
a. Personnel	CALFED 2001 015	\$ 1,015,798	\$	\$	\$	\$
b. Fringe Benefits						
c. Travel		39,640				
d. Equipment		77,900				
e. Supplies		22,372				
f. Contractual		749,950				
g. Construction						
h. Other						
i. Total Direct Charges (sum of 6a-6h)		1,905,660				
j. Indirect Charges (Overhead)		628,712				
k. TOTALS (sum of 6i and 6j)		\$ 2,534,372	\$	\$	\$	\$
7. Program Income		\$	\$	\$	\$	\$

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Standard Form 424A (Rev. 7-97)

Prescribed by OMB Circular A-102

**SECTION C - NON-FEDERAL RESOURCES**

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. CALFED 2001 for SJR DO Depletion	\$	\$ 15,000	\$ 66,200	\$ 81,200
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$	\$ 15,000	\$ 66,200	\$ 81,200

**SECTION D - FORECASTED CASH NEEDS**

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 2,534,372	\$ 1,013,748	\$ 506,874	\$ 506,874	\$ 506,876
14. Non-Federal	81,200	20,300	20,300	20,300	20,300
15. TOTAL (sum of lines 13 and 14)	\$ 2,615,572	\$ 1,034,048	\$ 527,174	\$ 527,174	\$ 527,176

**SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT**

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. SJR DO Depletion	\$ 750,000	\$	\$	\$
17.				
18.				
19.				
20. TOTAL (sum of lines 16-19)	\$ 750,000	\$	\$	\$

**SECTION F - OTHER BUDGET INFORMATION**

21. Direct Charges:	22. Indirect Charges: 35-63%
23. Remarks:	

**ASSURANCES - NON-CONSTRUCTION PROGRAMS**

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

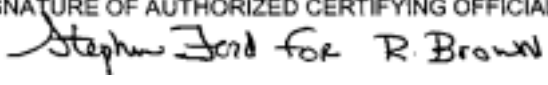
**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. **Further**, certain Federal awarding agencies may require applicants to **certify** to additional assurances. **If** such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§801 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, 'Audits of States, Local Governments, and Non-Profit Organizations.'
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 		TITLE Chief of Environmental Services Office	
APPLICANT ORGANIZATION Department of Water Resources, Environmental Services		DATE SUBMITTED May 15, 2000	



U.S. Department of the Interior

Certifications Regarding Debarment Suspension and  
Other Responsibility Matters, Drug-Free Workplace  
Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used; use this form for certification and sign; or use Department of the Interior Form 1954 (DI-1954). (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12.)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

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PART A Certification Regarding Debarment, Suspension, and Other Responsibility Matters  
Primary Covered Transactions

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CHECK ☒ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
  - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
  - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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PART B Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -  
Lower Tier Covered Transactions

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CHECK ☒ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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PART C: Certification Regarding Drug-Free Workplace Requirements

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**CHECK ☒ IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.**

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

- (a) ~~Publishing a statement notifying~~ employees that the unlawful manufacture, distribution, dispensing, possession, or use of a ~~controlled substance is prohibited~~ in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about—
  - (1) The dangers of drug abuse in the workplace;
  - (2) The grantee's policy of maintaining a drug-free workplace;
  - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
  - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (c) ~~Making it a requirement that~~ each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) ~~Notifying the employee~~ in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will —
  - (1) Abide by the terms of the statement; and
  - (2) ~~Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;~~
- (e) ~~Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every~~ **gal** officer on whose grant activity the convicted employee ~~was~~ working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;
- (f) ~~Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted —~~
  - (1) ~~Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or~~
  - (2) ~~Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;~~
- (g) ~~Making a good faith effort to continue~~ to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

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Check ☐ if there are workplaces on file that are not identified here.

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PART D Certification Regarding Drug-Free Workplace Requirements

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**CHECK ☐ IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.**

Alternate II. (Grantees Who Are Individuals)

- (a) ~~The grantee~~ certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;
- (b) ~~If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.~~

**PARTE:** Certification Regarding Lobbying  
Certification for **Contracts**, Grants, Loans, and Cooperative Agreements

**CHECK ☒ IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS \$100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT, SUBCONTRACT, OR SUBGRANT UNDER THE GRANTOR COOPERATIVE AGREEMENT.**

**CHECK — IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF \$150,000, OR A SUBGRANTOR SUBCONTRACT EXCEEDING \$100,000, UNDER THE LOAN.**

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

*Stephen Ford for R. Brown*

Dr. Randall L. Brown, Chief of Environmental Services Office

TYPED NAME AND TITLE

May 15.2000

DATE

DI-2010

March 1995

(This form consolidates DI-1953, DI-1954,

DI-1955, DI-1956 and DI-1963)

**APPENDIX A. SUMMARY BUDGET TABLES**

**San Joaquin River Dissolved Oxygen Depletion Year 2 Next Phase Funding Request for 2001**

Tasks	Direct Labor Hours	Salary & Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead	Equipment	Graduate Student Fee Remission	Other	Total Cost
Quantification of DWSC Sources and Mechanisms										\$ -
1 Continuous Water Quality Monitoring						50%				
Equipment Maintenance	475	\$ 5,400			\$15,000 /yr	\$ 5,400	\$10,000 /yr			\$ 35,800
Data Analysis	440	\$ 8,700				\$ 8,700				\$ 17,400
Reporting	220	\$ 5,400				\$ 5,400				\$ 10,800
Subtotal	1135	\$ 19,500	\$ -	\$ -	\$ 15,000	\$ 19,500	\$ 10,000	\$ -	\$ -	\$ 64,000
2 Algal Flux Study						50%				
Field	440	\$ 8,700			\$28,200 /yr	\$ 8,700				\$ 45,600
Analysis	220	\$ 5,400				\$ 5,400				\$ 10,800
Reporting	132	\$ 2,950				\$ 2,950				\$ 5,900
Subtotal	792	\$ 17,050	\$ -	\$ -	\$ 28,200	\$ 17,050	\$ -	\$ -	\$ -	\$ 62,300
3 Discrete Water Quality Sampling						40%				
Data Review & Reporting	100	\$ 1,500				\$ 1,000				\$ 2,500
Sampling & Laboratory Analyses	800	\$ 9,000			\$28,500 /yr	\$ 6,000	\$2,500 /yr			\$ 46,000
Project Management	100	\$ 1,500				\$ 1,000				\$ 2,500
Subtotal	800	\$ 12,000	\$ -	\$ -	\$ 28,500	\$ 8,000	\$ 2,500	\$ -	\$ -	\$ 51,000
4 Sediment Oxygen Demand - Direct Measurement						63%				
Field Analysis and Reporting	1150	\$ 56,718	\$15,000 /yr	\$12,100 /yr		\$ 46,059	\$32,000 /yr			\$ 181,877
Subtotal	1150	\$ 56,718	\$ 15,000	\$ 12,100	\$ -	\$ 46,059	\$ 32,000	\$ -	\$ -	\$ 181,877
5 Sediment Deposition and Re-suspension						52%				
Field Work	575	\$ 19,854	\$ 1,000	\$500 /yr		\$ 8,787	\$500 /yr			\$ 30,641
Laboratory	975	\$ 26,505		\$1,000 /yr	\$3,000 /yr	\$ 11,887	\$1,000 /yr			\$ 44,392
Data Analysis	595	\$ 16,904	\$ 1,000			\$ 7,577				\$ 25,481
Subtotal	2145	\$ 63,263	\$ 2,000	\$ 1,500	\$ 3,000	\$ 28,351	\$ 2,400	\$ -	\$ -	\$ 100,514
6 Algal Growth and Decomposition						50%				
Field Collection	908	\$ 20,500				\$ 20,500	\$4,000 /yr			\$ 45,000
Lab Assay	1056	\$ 23,600			\$40,000 /yr	\$ 23,600				\$ 87,200
Data Analysis	704	\$ 15,400				\$ 15,400				\$ 30,800
Reporting	440	\$ 10,000				\$ 10,000				\$ 20,000
Subtotal	3108	\$ 69,500	\$ -	\$ -	\$ 40,000	\$ 69,500	\$ 4,000	\$ -	\$ -	\$ 183,000
7 Tidal Exchange and Residence Time						35%				
Planning and Design	260	\$ 23,400	\$ 200			\$ 8,260				\$ 31,860
Dye Study	80	\$ 7,200	\$ 200		\$8,000 /yr	\$ 2,785				\$ 18,165
Modeling and Data Reduction	80	\$ 7,200				\$ 2,520				\$ 9,720
Reporting	60	\$ 5,400				\$ 1,890				\$ 7,290
Project Management	60	\$ 5,400				\$ 1,890				\$ 7,290
Subtotal	540	\$ 48,600	\$ 400	\$ -	\$ 8,000	\$ 17,325	\$ -	\$ -	\$ -	\$ 74,325
Subtotal for Task 1	9730	\$ 286,631	\$ 17,400	\$ 13,600	\$ 122,700	\$ 205,785	\$ 70,900	\$ -	\$ -	\$ 717,016

**San Joaquin River Dissolved Oxygen Depletion Year 2 Next Phase Funding Request for 2001**

Tasks	Direct Labor Hours	Salary & Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead	Equipment	Graduate Student Fee Remission	Other	Total Cost
Quantification of Upstream Source and Mechanisms						50%				\$ -
8 Upstream Watershed and River Water Quality Monitoring										\$ -
Design/Implement Monitoring Program	920	\$ 39,750	\$ 3,500		\$68,500 /w/	\$ 39,750	\$4,000 /p/			\$ 155,500
Data Interpretation and Report Writing	680	\$ 23,250			\$1,500 /w/	\$ 23,250				\$ 48,000
Subtotal	1600	\$ 63,000	\$ 3,500	\$ -	\$ 70,000	\$ 63,000	\$ 4,000	\$ -	\$ -	\$ 203,500
9 Groundwater Data Synthesis						35%				\$ -
Planning & Experimental Design	70	\$ 5,450				\$ 1,900				\$ 7,350
Records and Data Collection	208	\$ 15,400	\$ 300	\$375 /w/		\$ 5,390				\$ 21,465
Field Sampling	288	\$ 22,400	\$ 1,200	\$1,000 /w/	\$22,000 /w/	\$ 7,840				\$ 54,440
Analysis & Report	128	\$ 9,960			\$3,200 /w/	\$ 3,480				\$ 16,640
Project Management	40	\$ 3,000				\$ 1,000				\$ 4,000
Subtotal	734	\$ 56,210	\$ 1,500	\$ 1,375	\$ 25,200	\$ 19,610	\$ -	\$ -	\$ -	\$ 103,895
Subtotal for Task 2	2334	\$ 119,210	\$ 5,000	\$ 1,375	\$ 95,200	\$ 82,610	\$ 4,000	\$ -	\$ -	\$ 307,395
Management Tool Development						38%				\$ -
10 DO Management Model Expansion and Calibration										\$ -
Data Compilation	100	\$ 5,841				\$ 3,516				\$ 9,357
Model Calibration	900	\$ 46,728				\$ 28,128				\$ 74,856
Hypothesis Testing	200	\$ 11,682				\$ 7,032				\$ 18,714
Project Management	300	\$ 17,523	\$ 1,000			\$ 10,548				\$ 29,071
Subtotal	1400	\$ 81,774	\$ 1,000	\$ -	\$ -	\$ 49,224	\$ -	\$ -	\$ -	\$ 131,998
11 GIS-Based Watershed Modeling and Management Tool						38%				\$ -
Completion of GIS Layers	300	\$ 17,523			\$5,000 /w/	\$ 10,548				\$ 33,071
Completion of Metadata	300	\$ 17,523			\$5,000 /w/	\$ 10,548				\$ 33,071
Importation and Model Set-Up	600	\$ 35,046				\$ 21,096				\$ 56,142
Preliminary Calibration	500	\$ 29,205				\$ 17,580				\$ 46,785
Site Specific Algorithms	150	\$ 8,762			\$66,900 /w/	\$ 5,274				\$ 80,936
Subtotal	1850	\$ 108,059	\$ -	\$ -	\$ 76,900	\$ 65,046	\$ -	\$ -	\$ -	\$ 250,005
Subtotal for Task 3	3250	\$ 189,833	\$ 1,000	\$ -	\$ 76,900	\$ 114,270	\$ -	\$ -	\$ -	\$ 382,003
Management Alternatives Evaluation						35%				\$ -
12 Jet Aeration Evaluation										\$ -
Planning and Design	320	\$ 28,800	\$ 200			\$ 10,850	\$3,000 /w/			\$ 42,850
Field Measurement	80	\$ 7,200	\$ 200		\$5,000 /w/	\$ 2,625				\$ 15,025
Reporting	80	\$ 7,200		\$200 /w/		\$ 2,555				\$ 9,955
Project Management	60	\$ 5,400				\$ 1,890				\$ 7,290
Subtotal	540	\$ 48,600	\$ 400	\$ 200	\$ 5,000	\$ 17,920	\$ 3,000	\$ -	\$ -	\$ 75,120
13 Diffused Oxygen Technology-Pilot Project						35%				\$ -
Investigation of Existing Diffused Oxygen Technology	40	\$ 2,340	\$ 4,000	\$108 /w/		\$ 1,260				\$ 7,700
Procurement of Suitable Vessel	40	\$ 2,340	\$ 1,000	\$108 /w/	\$150,000 /w/	\$ 1,260				\$ 154,700
Design of Oxygen Diffusion Equipment	200	\$ 11,700		\$540 /w/		\$ 6,300				\$ 18,540
Deployment of Blubber Ship in Channel	200	\$ 11,700	\$ 1,000	\$540 /w/		\$ 6,300				\$ 19,540
Decommission Blubber Ship	40	\$ 2,340		\$108 /w/	\$5,000 /w/	\$ 1,260				\$ 8,700
Prepare Final Report	40	\$ 2,340		\$108 /w/		\$ 1,260				\$ 3,700
Project Management	80	\$ 5,310	\$ 1,000	\$216 /w/		\$ 1,890				\$ 8,410
Subtotal	620	\$ 38,070	\$ 7,000	\$ 1,720	\$ 155,000	\$ 19,530	\$ -	\$ -	\$ -	\$ 221,320
14 Inventory and Evaluation of BMP's						35%				\$ -
Metadata Development and Customization	150	\$ 9,750			\$6,750 /w/	\$ 5,250				\$ 6,750
BMP Inventory	300	\$ 19,500			\$30,000 /w/	\$ 10,500				\$ 45,000
BMP Evaluation	25	\$ 1,625				\$ 875				\$ 2,500
Final Report	88	\$ 5,720				\$ 3,080				\$ 8,800
Project Management										\$ -
Subtotal	563	\$ 36,595	\$ -	\$ -	\$ 35,750	\$ 19,705	\$ -	\$ -	\$ -	\$ 93,050

**San Joaquin River Dissolved Oxygen Depletion Year 2 Next Phase Funding Request for 2001**

San Joaquin River Dissolved Oxygen Depletion Year 2 Next Phase Funding Request for 2001										
Tasks	Direct Labor Hours	Salary & Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead	Equipment	Graduate Student Fee Remission	Other	Total Cost
15 Wetlands/Riparian Demonstration						35%				
Setup Metadata	8	\$ 468	\$ 100	\$22 /hr	\$4,400 /pp/	\$ 252				\$ 5,242
Investigation of Existing Riparian Vegetation/Wetlands	300	\$ 17,550	\$ 1,000	\$810 /hr		\$ 9,450				\$ 28,810
Evaluation of Wetlands in Grasslands Water District	120	\$ 7,020	\$ 1,500	\$324 /hr	\$55,000 /hr/	\$ 3,780				\$ 67,624
Constructed Wetland Planning & Experimental Design	120	\$ 14,625	\$ 1,500	\$675 /hr		\$ 7,875				\$ 24,675
Project Management	80	\$ 6,240		\$288 /hr		\$ 3,360				\$ 9,888
Subtotal	628	\$ 45,903	\$ 4,100	\$ 2,119	\$ 59,400	\$ 24,717	\$ -	\$ -	\$ -	\$ 136,239
16 Implementation Strategies Development						35%				
Sources and Technical Alternatives Review	160	\$ 12,400	\$ 200	\$200 /hr		\$ 4,400				\$ 17,200
Institutional Alternatives Development	244	\$ 19,000		\$350 /hr		\$ 6,600				\$ 25,950
Implementation Strategies Report	264	\$ 20,500	\$ 200	\$200 /hr	\$1,000 /hr/	\$ 7,220				\$ 29,120
Public Outreach Meetings	48	\$ 3,700	\$ 2,340	\$400 /hr	\$5,000 /hr/	\$ 1,300				\$ 12,740
Project Management	40	\$ 3,000				\$ 1,050				\$ 4,050
Subtotal	756	\$ 58,600	\$ 2,740	\$ 1,150	\$ 6,000	\$ 20,570	\$ -	\$ -	\$ -	\$ 89,060
17 Implementation Strategies Modeling						38%				
Sensitivity Analysis	300	\$ 17,523				\$ 10,548				\$ 28,071
Alternative Formulations	350	\$ 17,523				\$ 10,548				\$ 28,071
Alternative Evaluation	500	\$ 29,205			\$50,000 /hr	\$ 17,580				\$ 96,785
Project Management	400	\$ 23,364	\$ 1,000			\$ 14,064				\$ 38,428
Subtotal	1550	\$ 87,615	\$ 1,000	\$ -	\$ 50,000	\$ 52,740	\$ -	\$ -	\$ -	\$ 191,355
18 Indirect Impacts to South and Central Delta DO						35%				
Planning and Design	34	\$ 3,000	\$ 200			\$ 1,120				\$ 4,320
Monitoring	18	\$ 2,000	\$ 200		\$10,000 /mm/	\$ 770				\$ 12,970
Reporting	40	\$ 3,750				\$ 1,312				\$ 5,062
Project Management	22	\$ 2,000				\$ 700				\$ 2,700
Subtotal	114	\$ 10,750	\$ 400	\$ -	\$ 10,000	\$ 3,902	\$ -	\$ -	\$ -	\$ 25,052
19 Real Time Monitoring of Fish Migration						35%				
Planning and Design	200	\$ 18,000	\$ 200			\$ 6,370				\$ 24,570
Equipment Deployment	40	\$ 3,600	\$ 200		\$83,000 /hr/	\$ 1,330				\$ 88,130
Monitoring and Reporting	120	\$ 10,800	\$ 200	\$200 /hr/		\$ 3,885				\$ 15,085
Project Management	60	\$ 5,400				\$ 1,890				\$ 7,290
Subtotal	420	\$ 37,800	\$ 600	\$ 200	\$ 83,000	\$ 13,475	\$ -	\$ -	\$ -	\$ 135,075
Subtotal for Task 4	5141	\$ 363,933	\$ 16,240	\$ 5,397	\$ 405,150	\$ 172,560	\$ 3,000	\$ -	\$ -	\$ 966,279
Management Action Plan (To Be Developed in 2002)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal for Task 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$ -
Administrative										\$ -
Data Management and Handling										\$ 19,059
Data Management	250	\$ 8,940		\$1,000 /pp/		\$ 9,119				\$ 6,323
Project Management	75	\$ 3,131				\$ 3,182				\$ 4,612
Management O&M	50	\$ 1,788		\$1,000 /pp/		\$ 1,824				\$ 1,685

/a/ laboratory fees and instrument calibration	/aa/ office supplies and publication
/b/ instrumentation for continuous hydrolob and fluorometrics	/bb/ purchase of vessel and retrofit
/c/ laboratory and sampling materials	/cc/ breakdown and removal of oxygen equipment
/d/ laboratory	/dd/ metadata subcontract for initial development
/e/ PAR light meter	/ee/ inventory collection and organization
/f/ truck rental	/ff/ office supplies and publication
/g/ laboratory and materials	/gg/ metadata subcontract for initial development
/h/ construction of flux chambers	/hh/ laboratory
/i/ sampling and laboratory supplies	/ii/ office supplies
/j/ independent laboratory	/jj/ publication and graphics
/k/ field and laboratory electrodes/incubator	/kk/ meeting materials, displays, brochures, graphics
/l/ sampling equipment	/ll/ DWR modeling of recirculation over HOR
/m/ laboratory	/mm/ DeltaKeeper subcontract and vessel
/n/ sampling and analysis/laboratory	/nn/ subcontract with Hydroacoustic Technology, Inc.
/o/ laboratory	/oo/ publication
/p/ electrode probes	/pp/ office supplies and software
/q/ office supplies and records search fees	/qq/ peer review gratuity
/r/ sampling materials and bailers	
/s/ laboratory	
/t/ publication	
/u/ DWR, USGS, NRCS	
/v/ metadata subcontract for initial development	
/w/ site specific data collection by USGS and NRCS	
/x/ sampler construction	
/y/ sampling subcontract	
/z/ publication	



## **APPENDIX B. CALFED UPDATE ON YEAR 1 FUNDING STATUS**

### **Project Description**

The current project consists of funding for the first year of a three-year program to produce a management action plan to eliminate oxygen depletion below water quality objectives in the lower *SJR* during the fall. The schedule for the first year started on April 1, 2000.

The first year of this program was designed to determine the relative importance of natural and anthropogenic oxygen depleting substances and physical mechanisms to oxygen demand in the lower *SJR* in the fall. This information will be used in the second year to evaluate management alternatives and in the third year to develop a management action plan to eliminate the problem through an adaptive management strategy.

The tasks in the first year are to: (1) compile new and existing data on oxygen depleting substances in the *SJR* onto a relational database; (2) measure the daily load of oxygen depleting substances from urban, agricultural, natural and industrial surface water sources to daily oxygen demand; (3) measure the contribution of sediment oxygen depleting substances to daily oxygen demand; (4) evaluate the relative importance of tide and associated physical and chemical factors on daily load and oxygen demand; (5) use new and historic data to improve daily predictions of oxygen concentrations using an existing DO model developed for the *SJR*; and (6) use field data and modeling analyses to identify possible management alternatives for testing in year 2.

### **Conceptual Model**

The current conceptual model is that algal biomass from local and upstream sources, sediment deposits and Stockton treated effluent are major sources of oxygen depleting substances in the *SJR* and that these sources become a problem in the fall when water temperature is high and streamflow is low. Current information, however, is inadequate to fully evaluate this conceptual model and allocate the loads among potential sources for management purposes.

We will evaluate the conceptual model by direct field measurements and modeling results. Continuous fluorometry and simple mass balance calculations will directly measure the transport of algal biomass from upstream of Mossdale to the oxygen depletion zone. We will verify the relative contribution of both living and dead algal biomass within the lower *SJR* and upstream of Mossdale to the oxygen demand. The percent contribution of algal biomass to the total load of oxygen depleting substances will be determined from measurements of BOD, chlorophyll concentration, TOC, nutrients, biomarkers and flow from urban, industrial and agricultural sources throughout the upper and lower *SJR*. These surface water loads of oxygen depleting substances will be compared with direct measurements of organic and inorganic oxygen depleting substances in the sediment (sediment oxygen demand). Field sampling will begin at locations known to be important from historical data.

New and historic data on surface and sediment sources of oxygen depleting substances and associated physical and chemical data will be used to fill data gaps in the existing DO management model and enhance calibration and verification of controlling mechanisms. Comparison of new and historical field data with modeling results will provide insight for evaluation of alternatives and best management practices needed for development of a management action plan. A literature search will be conducted to determine the whereabouts of past studies on water quality within the *SJR* watershed and to preliminarily evaluate aeration alternatives.

### **Current Status**

The CALFED contract work schedule began on April 1, 2000, but the contract was not implemented until early May. Despite the contract delay, work on this project was begun before April 1, 2000, using

CALFED reimbursement funds as well as donated funds from local sources. CALFED reimbursement funds were used to measure and calculate the relative load of oxygen demanding substances from local and upstream sources (\$15,000), make model predictions of source loads (\$20,000), establish a database file with IEP (\$5,000) and begin contract management (\$8,000). In addition, because full CALFED funding was not available, local and state entities, the Cities of Turlock and Stockton, the DWR and RWQCB, and DeltaKeeper combined their resources to conduct pilot field studies and modeling runs in fall 1999. This information was used to obtain preliminary data on the relative load of oxygen-demanding substances into the DWSC from local and upstream sources and to produce six technical information reports. This work also resulted in semimonthly discussions of the dissolved oxygen problem by a multidisciplinary team that were used to refine the fall 2000 CALFED studies. Lastly, City of Stockton funds were donated to pay for meeting facilitation and public outreach.

Field sampling will begin in July 2000 in time to observe and assess the fall 2000 oxygen depletion. Work plans are being finalized and preparations are being made for this year's work. There are no outstanding regulatory or implementation issues. All necessary access and or approvals have been obtained.

## **APPENDIX C. LETTERS OF SUPPORT**



**Winston H. Hickox**  
*Secretary for  
Environmental  
Protection*

# California Regional Water Quality Control Board

## Central Valley Region

Steven T. Butler, Chair

Sacramento Main Office

Internet Address: <http://www.swrcb.ca.gov/~cwqcb5>  
3443 Rountree Road, Suite A, Sacramento, California 95827-3003  
Phone (916) 255-3000 • FAX (916) 255-3015

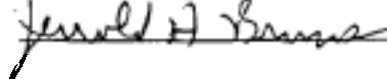


**Gray Davis**  
*Governor*

**TO:** San Joaquin River Dissolved  
Oxygen TMDL Steering Committee

**FROM:** Dennis Westcot  
Environmental Program Manager

**DATE:** April 11, 2000

**SIGNATURE:** 

**SUBJECT:** REGIONAL BOARD COMMITMENT OF RESOURCES TO PARTICIPATE IN THE  
CALFED PROPOSAL TITLED "SAN JOAQUIN RIVER DISSOLVED OXYGEN  
DEPLETION STUDIES - YEAR 2"

The Regional Board is committed to working with stakeholders to develop solutions to the dissolved oxygen problem in the San Joaquin River near Stockton. The Regional Board supports the proposal that is being developed and is willing to contribute **to** the effort by conducting special studies upstream of Vernalis to further evaluate oxygen demand constituents. The estimated contribution for this proposal (year 2001/2002) is \$10,000 in laboratory costs **and** \$5,000 in staff time for sample collection (total contribution of \$15,000). The special study would be designed and carried out in coordination with the Technical Committee responsible for administering the CalFed grant.



# CITY OF MANTECA

PUBLIC WORKS DEPARTMENT

May 4, 2000

CALFED/Bay Delta Program  
1416<sup>th</sup> Street, Room 1148  
Sacramento, CA. 95814

**SUBJECT Letter of Support for the San Joaquin River Low Dissolved Oxygen Grant Application**

The City of Manteca would like to express our strong support of the CALFED grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. The work to resolve this problem is being conducted under the supervision of a TMDL Steering Committee that consists of a number of stakeholders representing industrial, agricultural, urban, governmental, and environmental interests.

The TMDL Steering Committee has been meeting since January 1999, and excellent progress has been made toward defining the causes and possible resolutions of the low dissolved oxygen problem. The continued funding of this work through a CALFED grant is vital to the success of the TMDL processes. Approval of this grant would represent the second year funding of a three-year grant request.

Thank you for your consideration of this worthwhile grant application, and please feel free to contact Phil Govea at (209) 239-8463 should you have any questions.

Sincerely,

Michael F. Brinton  
Director of Public Works

City of **Turlock**  
Municipal Services  
901 S. Walnut Rd.  
Turlock, CA 95380



Dan Madden  
Water Quality Control Division Manager  
Phone No. (209) 668-5590  
Fax No. (209) 668-5695  
TDD No. 1-800-735-2929

April 19, 2000

CALFED/Bay Delta Program  
1416 9<sup>th</sup> Street Rm 1148  
Sacramento, CA 95814

Dear Program Manager,

This letter is in regard to the San Joaquin River Low Dissolved Oxygen Grant Application.

As a member of the San Joaquin TMDL Steering Committee and as a discharger into the San Joaquin River, the City of Turlock would like to voice its support for this Grant Application.

The TMDL Steering Committee is comprised of individual stakeholders representing Industry, Agriculture, Urban, Governmental and Environmental interests. Holding regular meetings since January of 1999, excellent progress has been made in the definition of possible causes and potential solutions to this problem. The grant being applied for represents the second year of a three year grant. In order for this Steering Committee to be successful in the accomplishment of its goal, this funding is critical.

Continued funding afforded through this grant will provide the committee the resources needed in its efforts to resolve the low dissolved oxygen problem in the lower San Joaquin River.

Should you have any questions please feel free to contact me at 209 668-5590.

Sincerely,

A handwritten signature in black ink, appearing to read "Dan Madden", written over a horizontal line.

**Dan Madden**  
WQC Division Manager  
City of Turlock



## CITY OF STOCKTON

### DEPARTMENT OF MUNICIPAL UTILITIES

2500 NAVY DRIVE  
STOCKTON, CA 95206-1131  
(209) 937-8750  
FAX (209) 937-8708

May 8, 2000

CALFED Bay-Delta Program  
1416 9th Street, Room 1148  
Sacramento, CA 95814

### **LETTER OF SUPPORT FOR THE SAN JOAQUIN RIVER LOW DISSOLVED OXYGEN GRANT APPLICATION**

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The Municipal Utilities Department of the City of Stockton would like to take this opportunity to express its strong support for the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work **is** being conducted under the supervision of a TMDL Steering committee that consists of a number of stakeholders representing industrial, agricultural, urban, governmental and environmental interests. The Stockton City Council has been apprised of this process and has committed its staff and financial resources to support this program insofar as possible.

The Committee has been meeting since January 1999 and excellent progress has been made toward defining the causes and possible solutions. This grant would represent the second year of a three year grant and is vital to keeping the work progressing.

If you have any questions regarding the City's interest in the San Joaquin River TMDL program, please contact Bob Murdoch, Stormwater Program Manager, at (209) 937-8734.

MORRIS L. ALLEN  
DIRECTOR OF MUNICIPAL UTILITIES

MLA:RM:rm

CITY COUNCIL

STEPHEN J. MANN, Mayor  
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Mayor Pro Tempore  
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**CITY OF LODI**  
**PUBLIC WORKS DEPARTMENT**

CITY HALL, 221 WEST PINE STREET  
P.O. BOX 3006  
LODI, CALIFORNIA 95241-1910  
(209) 333-6706  
FAX (209) 333-6710  
EMAIL pwdept@lodi.gov  
http://www.lodi.gov

H. DIXON FLYNN  
City Manager  
JACQUELINE L. TAYLOR  
Interim City Clerk  
RANDALL A. HAYS  
City Attorney  
RICHARD C. PRIMA, JR.  
Public Works Director

May 5, 2000

City of Stockton  
Municipal Utilities Department  
Attn: Bob Murdoch  
2500 Navy Drive  
Stockton, CA 95206

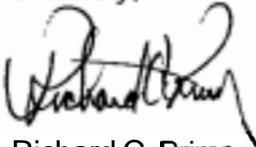
SUBJECT: Letter of Support for the San Joaquin River  
Low Dissolved Oxygen Grant Application

The City of Lodi fully supports the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted under the supervision of a TMDL Steering Committee that consists of a number of stakeholders representing industrial, agricultural, urban, governmental and environmental interests, including staff from the City of Lodi.

The Committee has been meeting since January 1999 and excellent progress toward defining the causes and possible resolution has been made. This grant would represent the second year of a three-year grant and is vital to keeping the work progressing. Since there are so many water quality problems in California, it is important that we be environmentally responsible, based on good data and analysis.

If you have any questions, please contact me at (209) 333-6759. Thank you for taking the lead in this important effort.

Sincerely,

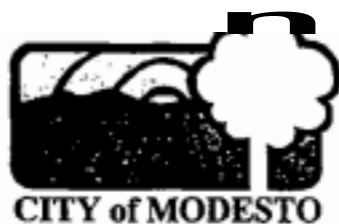


Richard C. Prima, Jr.  
Public Works Director

RCP/pmf

cc: Dixon Flynn, City Manager  
Fran Forkas, Water/Wastewater Superintendent  
Mike Schafer, Laboratory Services Supervisor





**Engineering and  
Transportation  
Department**

1010 Tenth Street  
Suite 4500  
P.O. Box 642  
Modesto, CA 95353

Hearing and Speech  
Impaired Only  
TDD 1-800-735-2929

Administration  
209/577-5213  
209/571-5521 Fax

Airport  
209/577-5318  
209/576-1985 Fax

Construction  
Administration  
209/577-5452  
209/577-4302 Fax

Encroachment  
Permits  
209/577-5264  
209/491-5969 Fax

Engineering  
Services  
209/577-5215  
209/522-1780 Fax

Public Transit  
209/577-5295  
209/571-5521 Fax

Solid Waste  
Management  
209/577-5494  
209/521-4801 Fax

Traffic Engineering  
209/577-5295  
209/571-5521 Fax

Traffic Signals  
Street Lighting  
209/577-5334  
209/491-5903 Fax

Utilities Services  
and Franchises  
209/577-5468  
209/521-4801 Fax

CALFED/Bay Delta Program  
14169<sup>th</sup> Street, Room 1148  
Sacramento, Ca. 95814

March 30,2000

**LETTER ~~OF~~ SUPPORT FOR THE SAN JOAQUIN RIVER LOW  
DISSOLVED OXYGEN GRANT APPLICATION**

The City **of** Modesto would like to take this opportunity to express **our** strong support for the grant application to continue funding the efforts to resolve the low **dissolved** oxygen problem in the San Joaquin River. This **work** is being conducted under the supervision of a **TMDL** Steering Committee that consists **of** a number of stakeholders representing industrial, agricultural, urban, governmental and environmental interests.

The Committee **has** been meeting since January 1999 and excellent **progress** toward defining the causes and possible resolution has been made. This grant would represent the second year of a three-year grant and is vital to keeping the **work** progressing.

If you have any questions, please contact **Garner R. Reynolds** at (209) 571-5120.

Sincerely,

Glen K. Lewis  
Engineering **and** Transportation Director



1315 K STREET  
MOOESTO, CALIFORNIA 95354-0917  
TELEPHONE (209) 5276453  
FAX (209) 527.0630

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April 18,2000

CALFED/Bay Delta Program  
1416Ninth Street, Room 1148  
Sacramento, CA 95814

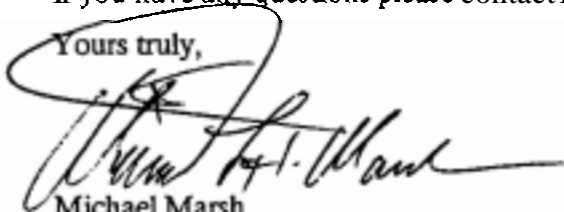
Dear **Sir** or Madam:

**Western** United Dairymen wishes to express our strong support for the enclosed grant application for the continuation of the funding for the stakeholder process working to resolve the low dissolved oxygen problem in the San Joaquin River. A TMDL Steering Committee that represents numerous stakeholders, including agriculture, urban, governmental, and environmental interests is supervising the work.

**Work** began in January of 1999, and substantial progress has been made toward defining the causes and developing potential solutions to the problem. **This** grant would fund the second year of a three. year grant, and is absolutely vital to keep the effort moving forward.

If you have any questions please contact Paul Martin at (707) 763-8874.

Yours truly,



Michael Marsh  
Chief Executive Officer

cc: Paul Martin

# PORT OF STOCKTON

Phone: (209)946-0246



Fax: (209)465-7244

May 4, 2000

Transmitted Via US Mail  
CALFED/Bay Delta Program  
14169<sup>th</sup> Street, Room 1148  
Sacramento, CA 95814

**RE** Letter **CE** Support For **The** San Joaquin **River** **JAW** Dissolved **Oxygen** Grant Application

To Whom It May Concern:

The Port of Stockton would like to take this opportunity to express our strong support for the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted **under** the supervision of a TMDL Steering Committee that consists of a number of stakeholders representing industrial, agricultural, urban, governmental and environmental interests.

The Committee has been meeting since January 1999 and excellent progress toward defining the causes and possible resolution has been made. This grant would represent the second year of a three-year grant and is vital to keeping the work progressing.

If you have any questions, please contact the undersigned at 209-946-0246

Sincerely,

**Jay R. Jahangiri, M.S., REM, REA**

Director of Environmental and Regulatory Affairs

JRJ/rk

CC: Mr. Richard Aschieris, Port Director



## 2000 BOARD OF DIRECTORS

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Grupe communities Inc.

**Don Tucker, Vice President**  
Horizon Hous

**Shane Hutt, Secretary/Treasurer**  
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Immediate Past President  
Bennett Development Inc.

**Mike Hakeem**  
Member, Executive Committee  
Hakeem, Ellis, Simonelli & Marengo

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Herum, Crabtree, Brown, Dyer, Zolezzi  
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**Matt Arnaiz**  
H.D. Arnaiz Corporation

**Suzanne Candini**  
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**Tony D'Alessandro**  
Pacific Gas & Electric

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Tokay Development Inc.

**John Looper**  
Teichert Construction

**Steve Nilssen**  
North American Mortgage

**Tom Marie Raymus**  
Raymus Development & Sales

**Ran Scatena**  
Fint American Title

**Tony Souza**  
Souza Development

**Kevin Thomas**  
Old Republic Title

**Kevin A. Sharrar**  
Executive Director, BIA of the Delta

# BUILDING INDUSTRY ASSOCIATION OF THE DELTA

May 1, 2000

**CALFED Bay Delta Program**  
14169th Street, Room 1148  
Sacramento, CA 95814

## Re: Letter Of Support For The San Joaquin River Low Dissolved Oxygen Grant Application

Dear Sir/Madam,

The Building Association of the Delta would like to take this opportunity to express **our** strong support **for** the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. **This** work is being conducted under the supervision **of** a TMDL Steering Committee that consists **of** a number **of** stakeholders representing industrial, agricultural, urban, governmental and environmental interests.

The Committee **has** been meeting since January 1999 and excellent progress toward defining the causes and possible solutions has been made. This grant would represent the second year **of** a three year grant and is vital to keeping the work progressing.

If you have any questions, please contact me at (209) 235-7831.

Sincerely,

A handwritten signature in dark ink, appearing to read "Kevin Sharrar". Below the signature, the text "Kevin Sharrar - Executive Director" and "BIA of the Delta" is printed.

Kevin Sharrar - Executive Director  
BIA of the Delta

cc: Doug Unruh, President  
BIA of the Delta

**1150 WEST ROBINHOOD DRIVE, SUITE 4C**  
**STOCKTON, CALIFORNIA 95207-5624**

PHONE (209) 235-7831  
FAX (209) 235-7837



# Stanislaus County Farm Bureau

VITO CHIESA  
PRESIDENT

JAN MARIE ENNENCA  
EXECUTIVE MANAGER

1201 I. Street  
Modesto, CA 95354  
Phone: (209) 522-7276  
Fax: (209) 521-9938

86

YEARS  
OF

EXCELLENCE

1914 - 2000

May 5, 2000

CALFED/BAY DELTA PROGRAM  
1416 9TH STREET, ROOM 1148  
SACRAMENTO, CA 95814

## LETTER OF SUPPORT FOR THE SAN JOAQUIN RIVER LOW DISSOLVED OXYGEN GRANT APPLICATION

Stanislaus County Farm Bureau strongly **supports** the grant application to continue to fund efforts to resolve the low dissolved oxygen problem in the San Joaquin River. **This work is being** conducted under the supervision of a TMDL Steering Committee that consists of a **number** of stakeholders representing **agricultural**, environmental, governmental, industrial and **urban** interests.

The Committee has been meeting since January 1999 and has made excellent progress toward **defining** the causes **and** possible resolution. This grant would represent the second year of a three-year grant is vital to keeping the work progressing.

If you have any questions, please contact our representatives to these meetings, Wayne Zipser (209) 602-9251 or Al Brizard (209) 632-9900. Thank you for your consideration of **the** grant application.

Sincerely,

VITO CHIESA  
PRESIDENT

## SOUTH DELTA WATER AGENCY

3031 WEST MARCH LANE, SUITE 332 EAST

POST OFFICE BOX 70392

STOCKTON, CALIFORNIA 95267

TELEPHONE (209) 956-0150

FAX (209) 956-0154

EMAIL [jherrlaw@aol.com](mailto:jherrlaw@aol.com)

Directors:

Jerry Robinson, Chairman

Robert K. Ferguson, Vice-Chairman

Alex Hidebrand, Secretary

Natalino Bacchetti

Mark Bacchetti

Counsel:

John Herrick

Engineer:

Gerald T. Orlob

April 19, 2000

CALFED Bay Delta Program

1416 9<sup>th</sup> Street, Room 1148

Sacramento, CA 95814

Dear CALFED:

South Delta **Water** Agency wishes **to express** its strong support for the **grant** application **to** continue funding the efforts to resolve the **low** dissolved oxygen problem in the San Joaquin River. **This work** is being conducted under the supervision of a TMDL Steering **Committee** that consists of a number of stakeholders representing industrial, agricultural, urban, governmental, **and** environmental interests.

The Committee has been meeting since January 1999, and excellent **progress** towards defining the causes **and** possible resolution has been made. This grant **would** represent the second year of a three-year grant and is vital to keeping the **work** progressing.

Please call **me** if you have any questions or **comments**.

Very truly yours,



JOHN HERRICK

JH/dd



5110100

CALFED Bay Delta Program  
14169th Street, Room 1148  
Sacramento, CA 95814

Re: Letter of support for the San Joaquin River low dissolved oxygen grant application

Tyco Printed Circuit Group, Stockton would like to take this opportunity to express our strong support for the grant application *to* continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted under the supervision of the San Joaquin River Total Maximum Daily Load Committee. This committee consist of a number of stake holders that include industrial, agricultural, environmental, and governmental concerns.

The Committee has been. meeting'since January 1999 and excellent progress toward defining the causes and possible solutions has been made. This grant would represent the second year of a three year grant and is vital to keeping the work progressing.

If you have any questions, please contact me (209) 466-3607 or [Lloyd.finley@tpcg.net](mailto:Lloyd.finley@tpcg.net)

Respectfully,

A handwritten signature in cursive script that reads "Lloyd Finley".

**Lloyd Finley**  
Manager Environmental Affairs



## CITY OF TRACY

### Public Works Department

520 Tracy Blvd.  
Tracy, CA 95376

Telephone: (209) 831-4420

Fax: (209) 831-4430

May 9, 2000

CALFED Bay Delta Program  
1416 9<sup>th</sup> Street, Room 1148  
Sacramento, CA 95814

Gentlemen:

RE: LETTER OF SUPPORT FOR THE SAN JOAQUIN RIVER LOW DISSOLVED  
OXYGEN GRANT APPLICATION

The City of Tracy would like to take this opportunity to express our strong support for the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted under the supervision of a TMDL Steering Committee that consists of a number of stakeholders representing industrial, agricultural, urban, governmental and environmental interests.

The committee has been meeting since January 1999 and excellent progress toward defining the causes and possible solutions has been made. This grant would represent the second year of a three year grant and is vital to keeping the work progressing.

If you have any questions, please contact me at (209) 831-4431.

Sincerely,

Nicholas Pinhey  
Director of Public Works

NP:ksl

08-050900kl



**BOARD OF SUPERVISORS**222 EAST WERER AVENUE, ROOM 701  
STOCKTON, CALIFORNIA 95202TELEPHONE: 209/468-3113  
Fax: 209/468-3694DAVID L. BAKER  
County AdministratorTERRENCE R. DERMODY  
County CounselLOIS M. SAHYOUN  
Clerk of the BoardEDWARD A. SIMAS  
CHAIRMAN  
THIRD DISTRICTJACK A. SIEGLOCK  
VICE CHAIRMAN  
FOURTH DISTRICTSTEVE GUTIERREZ  
FIRST DISTRICTDARIO L. MARENCO  
SECOND DISTRICTROBERT J. CABRAL  
FIFTH DISTRICT

May 11, 2000

**CALFED** Bay-Delta Program  
1416 Ninth Street, Room 1148  
Sacramento, California **95814**SUBJECT: **LETTER OF SUPPORT FOR THE SAN JOAQUIN RIVER  
LOW DISSOLVED OXYGEN GRANT APPLICATION**

Gentlemen:

The San Joaquin County Board of Supervisors **supports** the Application for the San Joaquin River Low Dissolved Oxygen Grant, which is **being** conducted under the guidance of the **City of** Stockton's Total **Maximum** Daily Load Steering Committee. The Steering Committee, comprised of a number of stakeholders representing industrial, agricultural, urban, governmental and environmental **interests**, **has** been meeting since January of 1999.

The funding **will** continue to be used toward defining **the** causes and possible **solutions** in order to resolve **the low** oxygen **problem** in the San Joaquin River. This grant will represent the **second** year of a three-year grant and is vital to advancing the **work** in progress.

**Your** support **of** this important Grant Application **is** appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "E. Simas", is written over a light-colored background.

**EDWARD A. SIMAS, Chairman**  
Board of Supervisors  
Third DistrictEAS:THM:to  
CALFEDLOW-OXYGEN

c: Manuel Lopez, Director of Public Works

# ***WID***

---

## **City of Stockton Wet Industry Dischargers**

H.E. Stone P.E. Consultant 300 Galt Ct. Los Altos, CA 94022-3019 Phone/FAX (650) 948-6580

May 8, 2000

CALFED/Bay Delta Program  
1416 9<sup>th</sup> Street, Room 1148  
Sacramento, CA 95814

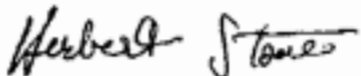
Subject: SAN JOAQUIN RIVER/TMDL GRANT APPLICATION

The Wet Industry Dischargers (WID) in the City of Stockton would like to take this opportunity to express support for the grant application to continue funding the TMDL study on the low dissolved oxygen problem in the San Joaquin River. WID has been a stakeholder/participant along with the other representatives of industrial, agricultural, urban, governmental and environmental interests in the TMDL Steering Committee working on this issue since January 1999.

WID believes that progress has been made and that a continuation of the TMDL study, with continued grant support from CALFED, is essential to finding the cause or causes of the low dissolved oxygen problem and to developing a plan for its resolution.

If *you* have any questions, please contact me at 650-948-6580.

sincerely,



Herbert E. Stone P.E.  
Consultant  
Wet Industry Dischargers



## CALIFORNIA URBAN WATER AGENCIES

May 15, 2000

CALFED Bay-Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, California 95814

Attention: Proposal Review Team

Dear Sir or Madam:

Support for the San Joaquin River Dissolved Oxygen Depletion Proposal,

The California Urban Water Agencies (CUWA) would like to take this opportunity to express ~~strong~~ support for the San Joaquin River Dissolved Oxygen Depletion Proposal (proposal). This Proposal requests second year next-phase funding to continue efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted under the supervision of the San Joaquin River Dissolved Oxygen Steering and Technical Committees that include representation from industrial, agricultural, urban, governmental and environmental stakeholders. Many of the studies included in the Proposal would provide important information and analytical tools that would also be beneficial to efforts to improve drinking water quality for Delta water supplies.

CUWA represents twelve of California's largest urban water agencies, and is particularly interested in protecting the quality and quantity of the water delivered by these agencies to more than 20 million people in northern and southern California. CUWA has been an active participant in the CALFED Program since its inception, and one of its key objectives has been to pursue source water quality improvement in the Delta to protect public health and promote better water management.

The studies included in the Proposal will provide valuable information concerning loads of organic carbon and nutrients into the San Joaquin River, which influences water quality conditions in the Central and South Delta. Levels of organic carbon in Delta water are a concern to CUWA because organic carbon reacts with disinfectants in the drinking water treatment process to form disinfection by-products, which are a public health concern and are expected to be more stringently regulated in the near future. Levels of nutrients in Delta water are also a concern to drinking water suppliers. Nutrients contribute to excess algae growth in storage reservoirs and in aqueducts, which can result in treatment difficulties and production of unpleasant tastes and odors.

Of particular interest to CUWA are elements of the Proposal that will contribute to our understanding of causes of water quality degradation in the Delta, sources of organic carbon and nutrients in the San Joaquin River watershed, and potential strategies to reduce pollutant loads and improve water quality. For example:

- The water quality monitoring elements of the Proposal will provide valuable water quality data that will be used to delineate and quantify sources of nutrients, organic carbon and other constituents in the San Joaquin River watershed.
- The GIS-based watershed modeling element of the Proposal will provide an important tool for evaluating strategies to control loads of nutrients and organic carbon from nonpoint sources in the San Joaquin River Watershed.
- The inventory and evaluation of BMPs included in the Proposal will provide needed information on potential strategies to reduce pollutant loads from nonpoint sources. This information will be useful to address other water quality problems in the Bay-Delta watershed.

CUWA supports continued funding for the San Joaquin River dissolved oxygen depletion studies and evaluation of management strategies, and urges CALFED to support the San Joaquin River Dissolved Oxygen Depletion Proposal. If you have any questions, please contact me at (916) 552-2929.

Sincerely,



Byron M. Buck  
Executive Director



# MANUFACTURERS COUNCIL

## O F T H E C E N T R A L V A L L E Y

POST OFFICE BOX 1544, MODESTO, CA 95353 • 209-523-0886 • FAX 209-523-0887

**CHRIS REARDON**  
EXECUTIVE DIRECTOR

### MEMBERS

A.L. GILBERT  
BERRY SEED & FEED  
ATWATER CANNING CO.  
BAKING VEGETABLE PRODUCTS  
BEST ENVIRONMENTAL  
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MODESTO WELDING PRODUCTS  
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STANISLAUS FOOD PRODUCTS  
SUN CHEMICAL  
TRI-VALLEY GROWERS  
TRIM MASTERS INC.  
WATTHEY ELECTRIC COMPANY

May 8, 2000

CALFED Bay Delta Program  
1416 9th Street, Room 1148  
Sacramento, CA 95814

To whom it may concern,

On behalf of the Manufacturers Council of the Central Valley, I wish to express my support for the grant application to continue funding the efforts to resolve the low dissolved oxygen problem in the San Joaquin River. As your probably aware, this important work is being done under the supervision of a TMDL Steering Committee that represents a broad of coalition of interests.

Since the committee has begun its work in January 1999, real progress has been made in both the defining the causes and looking at possible resolutions. It is our hope that you will continue the second year of a three year grant which is critical to our continued progress.

With the above comments in mind, we look forward to working with you in the future.

Sincerely,

Christopher W. Reardon  
Executive Director

**MWD**

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

May 12, 2000

CALFED Bay-Delta Program  
 1416 Ninth Street, Suite 1155  
 Sacramento, CA 95814

Attention: Proposal Review Team:

Dear Sir or Madam:

Support for the San Joaquin River Dissolved Oxygen Depletion Proposal

The Metropolitan Water District of Southern (Metropolitan) would like to take this opportunity to express its strong support for the San Joaquin River Dissolved Oxygen Depletion Proposal (Proposal). This Proposal requests second year next-phase funding to continue efforts to resolve the low dissolved oxygen problem in the San Joaquin River. This work is being conducted under the supervision of the San Joaquin River Dissolved Oxygen Steering and Technical Committees that include representation from industrial, agricultural, urban, governmental and environmental stakeholders. Many of the studies included in the Proposal would provide important information and analytical tools that would also be beneficial to efforts to improve drinking water quality for Delta water supplies.

Metropolitan provides supplemental water supplies to over 16 million people in southern California, and one of our major sources of supply is Delta water conveyed through the State Water Project. We have been an active participant in the CALFED Program since its inception, and one of our key objectives has been to pursue source water quality improvement in the Delta to protect public health and promote better water management.

The studies included in the Proposal will provide valuable information concerning loads of organic carbon and nutrients into the San Joaquin River, which influences water quality conditions in the Central and South Delta. Levels of organic carbon in Delta water are a concern to Metropolitan and other urban drinking water suppliers because organic carbon reacts with disinfectants in the drinking water treatment process to form disinfection by-products, which are a public health concern and are expected to be more stringently regulated in the near future. Levels of nutrients in Delta water are also a concern to drinking water suppliers. Nutrients contribute to excess algae growth in storage reservoirs and in aqueducts, which can result in treatment difficulties and production of unpleasant tastes and odors.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

## Proposal Review Team

Page 2

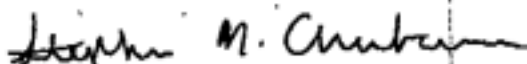
May 12, 2000

Of particular interest to Metropolitan are elements of the Proposal that will contribute to our understanding of causes of water quality degradation in the Delta, sources of organic carbon and nutrients in the San Joaquin River watershed, and potential strategies to reduce pollutant loads and improve water quality. For example:

- The water quality monitoring elements of the Proposal will provide valuable water quality data that will be used to delineate and quantify sources of nutrients, organic carbon and other constituents in the San Joaquin River watershed.
- The GIS-based watershed modeling element of the Proposal will provide an important tool for evaluating strategies to control loads of nutrients and organic carbon from nonpoint sources in the San Joaquin River watershed.
- The inventory and evaluation of BMPs included in the Proposal will provide needed information on potential strategies to reduce pollutant loads from nonpoint sources. This information will be useful to address other water quality problems in the Bay-Delta watershed.

Metropolitan supports continued funding for the San Joaquin River dissolved oxygen depletion studies and evaluation of management strategies, and we urge CALFED to support the San Joaquin River Dissolved Oxygen Depletion Proposal. If you have any questions, please contact Lynda Smith at (916) 650-2632.

Very truly yours,



Stephen N. Arakawa, Manager  
Water Resource Management Group

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cc: Mr. Byron Buck  
California Urban Water Agencies